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EXPERT GUIDE TO MODELLING

- Master hard surface models
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PROS SHARE THEIR 3D SECRETS
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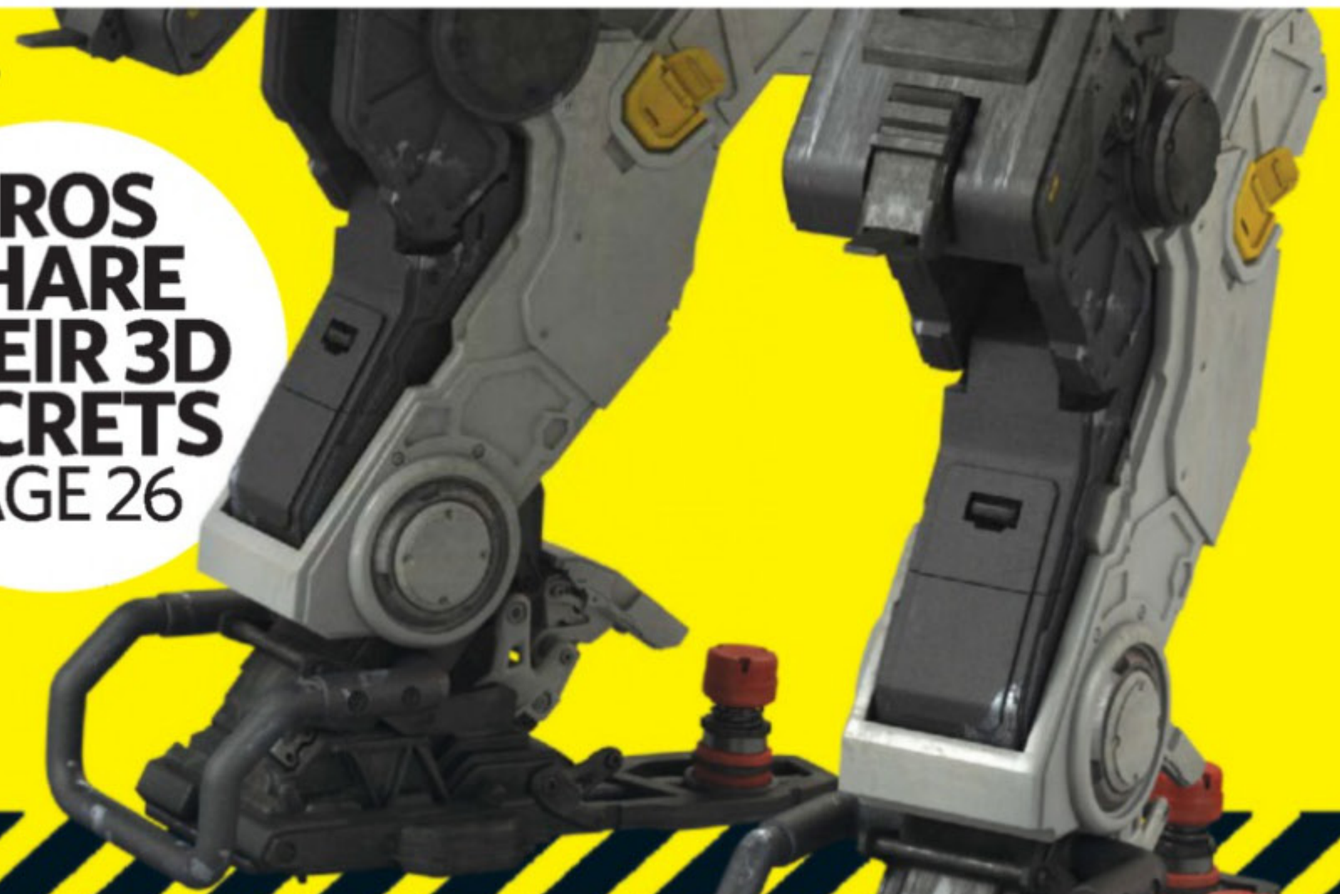

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“The key is to be extremely passionate about what you do and try to better yourself. Never be satisfied with the work you did yesterday”

Fausto de Martini spells out a few home truths **Page 26**

Fausto de Martini

Personal portfolio site
www.faustodesign.com

Country Brazil

Software 3ds Max, V-Ray, Photoshop

Starting on p26 we have pulled together some of the best 3D modelling talent from around the world to talk about their favourite techniques. We've covered all the bases, from hard surfaces to sci-fi, creature creation to human models, so check out the feature and start improving your modelling today!

Welcome

to the magazine and 100 pages of amazing 3D

Welcome to 3D Artist magazine!
We constantly strive to bring you advice and inspiration from the best 3D artists in the business, and this month we have pulled together some of the most accomplished modellers in the industry to provide you with sure-fire ways to improve your modelling workflow and achieve incredible results (p26). Also in the mag, we have our usual huge selection of expert tutorials covering all aspects of the 3D pipeline. Enjoy the issue!

Dan Hutchinson Editor in Chief

Every issue you can count on...

1. **Exclusively commissioned art**
2. Behind-the-scenes guides to images and fantastic artwork
3. **Digital downloads full of handy assets**
4. Interviews with inspirational artists
5. **Tips for studying 3D or getting work in the industry**
6. The chance to see your art in the mag!

This issue's team of expert artists...

Sérgio Merêces

Sérgio has lent us his arch-vis genius again, crafting a beautiful Zen Garden and walking you through how to make it yourself in 17 steps. You'll find his tutorial on p46.

Warner McGee

If you're interested in improving your cartoon characters in MODO, head to p56 for Warner McGee's expert advice on how to use deformers to your advantage.

Rainer Duda

The former Houdini TD has turned his attention to Clarisse IFX this month, and walks you through look development. Take a look at his tutorial, which starts over on p72.

Andrew Maximov

Andrew has taken a break from making *Uncharted 4* to bring you an amazing tutorial on how to texture complex game assets. Head over to p70 for his insight.

Tom Parker

Tom is back this month with a guide to texturing in ZBrush – specifically, photorealistic scarring for characters. You can find his incredible tutorial over on p78.

Vincent North

After Effects wizard Vince has taken a critical look at Element 3D Version 2 this month, and he had a lot of fun with the plugin. Head over to p85 for his expert opinion.

Daniele Orsetti

MARI expert Daniele has drawn on his vast knowledge of the software to review MARI indie on p84, which has recently been released through game distribution service Steam.

Particle Skull

On p66 the experts at Particle Skull teach you the ins and outs of advanced rain simulation in 3ds Max using Particle Flow. Check out FileSilo for some extra goodies, too.

Chris McMahon

Former **3D Artist** editor Chris speaks to David 'vyle' Levy about how he managed to turn 2D concepts into a sci-fi 3D short by teaching himself compositing over on p92.

Sign up, share your art and chat to other artists at www.3dartistonline.com

3DArtist

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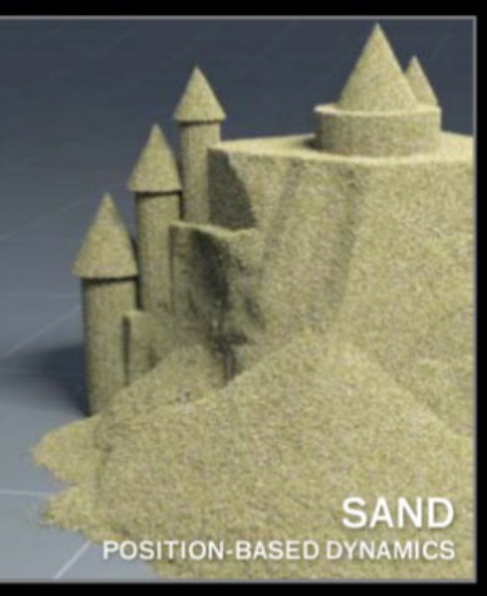

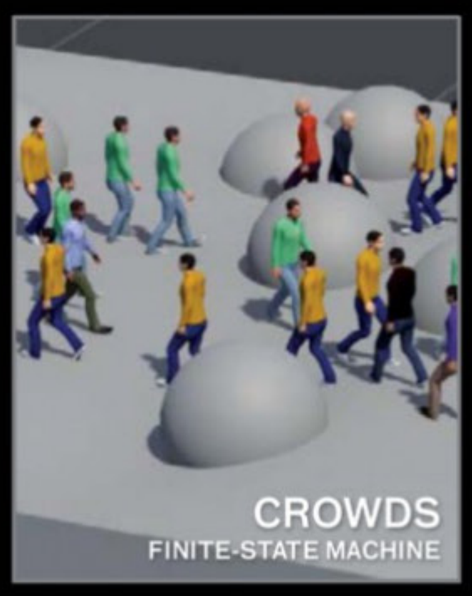

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Nvidia's new VCA hardware looks set to revolutionise rendering. We found out how and why

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Having recently launched on game platform Steam, we take a look at The Foundry's latest offering

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Daniele Orsetti casts a critical eye over the Steam version of MARI

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Vincent North finds out how well Element 3D V2 holds up in an After Effects workflow

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We get stuck into the latest ZBrush book from 3DTotal

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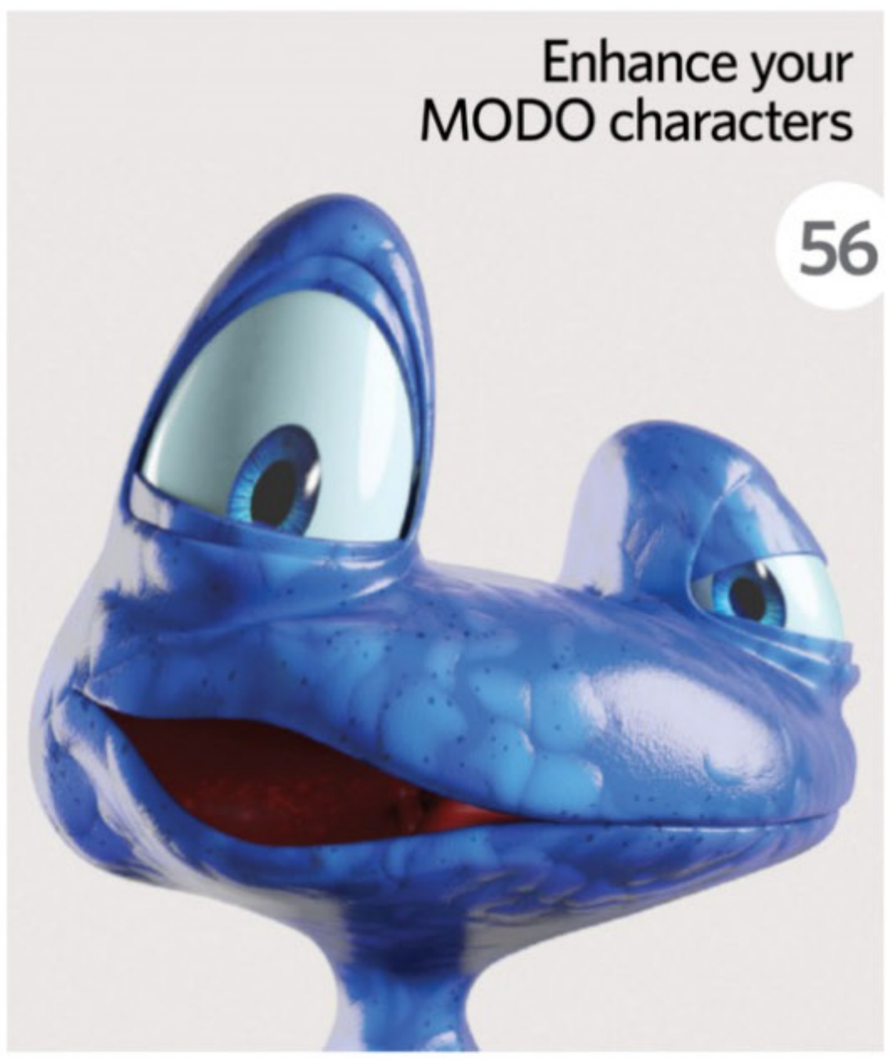
Expert guide to modelling

"In some scenes for Transformers I had to generate around 100 million polygons"

Fausto de Martini highlights the demands of concept modelling **Page 26**



Enhance your MODO characters

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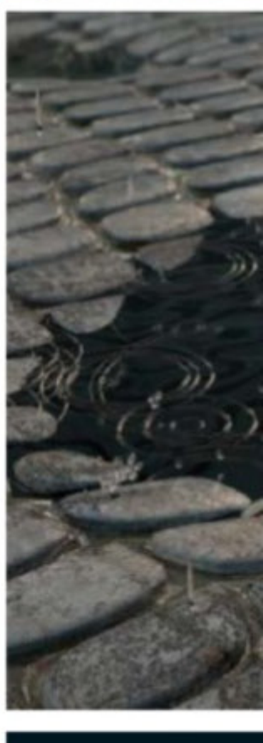
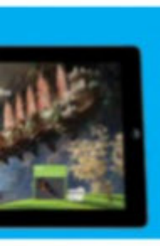
Create a zen garden





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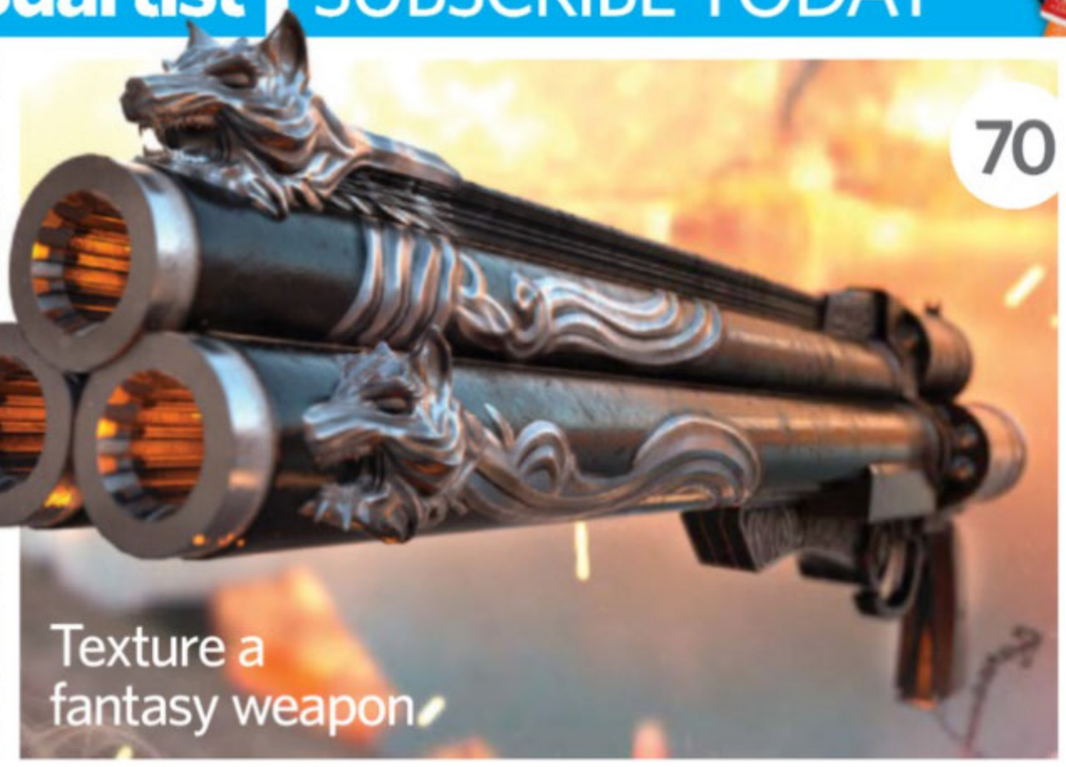
Advanced rain simulation



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Texture a fantasy weapon

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“It changed the way I work, and not only because the VCA is amazingly fast”

Kevin Margo explains his love for the Nvidia VCA **Page 38**

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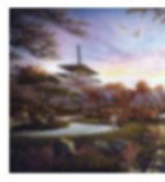

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The Gallery

Have an image you feel passionate about? Get your artwork featured in these pages
Create your gallery today at **www.3dartistonline.com**

Marek Denko

After a long freelancing career in 3D, Marek established NoEmotion studio in 2007

Personal portfolio
marekdenko.net

Country Slovakia/Czech Republic

Software 3ds Max, V-Ray, Photoshop

Work in progress...

“This personal piece started with doodling and turned into weeks of modelling, texturing, rendering and detailing. It was created in 3ds Max and rendered with V-Ray; final colour tweaks were done in Photoshop. This is dedicated to my wife and three little piglets!”

Marek Denko, *Return to Prime Even*, 2014

> I was inspired by Tibetan Buddhist tradition and every step was challenging. My goal was not photorealism but to make an idealised vision of an instance in time

Hugues Giboire, *Another Turn of the Wheel,* 2014

Hugues Giboire

3DArtist online

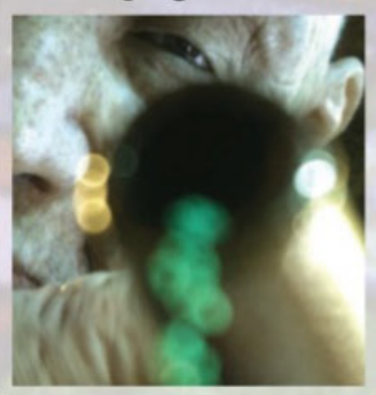
Username: 3DPeyote

Personal portfolio
www.3dpeyote.net

Country Canada

Software Maya, Mudbox, Octane Render

Work in progress...



Anto Tony Juricic

3DArtistonline

Username: Grapix

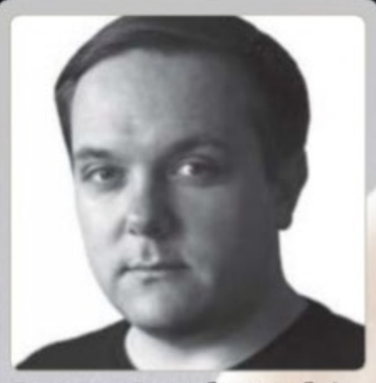
Personal portfolio
anto-toni.cgsociety.org

Country Canada

Software Maya, ZBrush, MARI

“This illustration has again taught me the importance of a well-defined concept. Staying on top of a 2D concept is time-consuming, but it’s given me an opportunity to train my patience and enjoy the process”

Anto Tony Juricic, *Cheers!*, 2014



Lucas Sztukowski

3DArtistonline

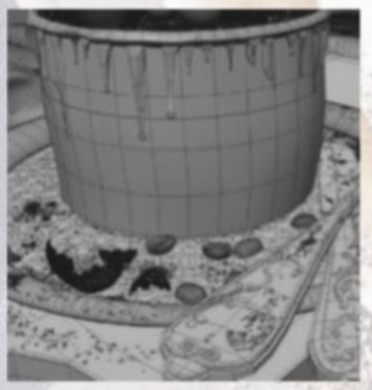
Username: Lucas Sztukowski

Personal portfolio
www.visualworkshop3d.ch

Country Switzerland

Software 3ds Max, MeshPaint, Corona, Photoshop

Work in progress...



> It started with an idea from my fiancée Jowita; she found the inspirational materials and motivated me to make this piece. The only downside of all this was that we could not eat the cake at the end!

Lucas Sztukowski, *Ice Cream Cake*, 2014

“This is the concept image which we are planning to make a movie with. The main pieces of software that we use are Maya, ZBrush, MARI, Shave and a Haircut, V-Ray and NUKE”

Yuka & Teruyuki Ishikawa, *Courir*, 2014

Yuka & Teruyuki Ishikawa

Yuka and Teruyuki are a husband and wife 3D team. They live and work in Tokyo

Personal portfolio
www.telyuka.com

Country Japan

Software Maya, ZBrush, V-Ray

Work in progress...

Maciej Drabik

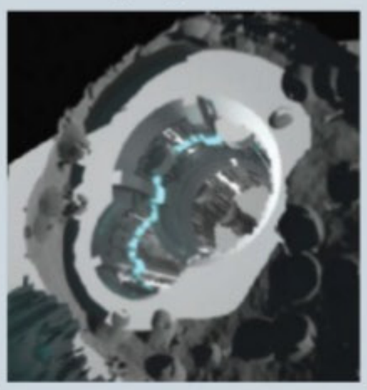
Maciej is a concept artist, illustrator, 3D generalist and UI designer in the games industry

Personal portfolio
maciejdrabik.artstation.com

Country Poland

Software 3ds Max, V-Ray, Photoshop

Work in progress...



"I like to mix 3D with photos and painting. It's not necessary to do the texture work in 3D when creating a static image – you can do that in Photoshop. It gives you more control and it's faster"

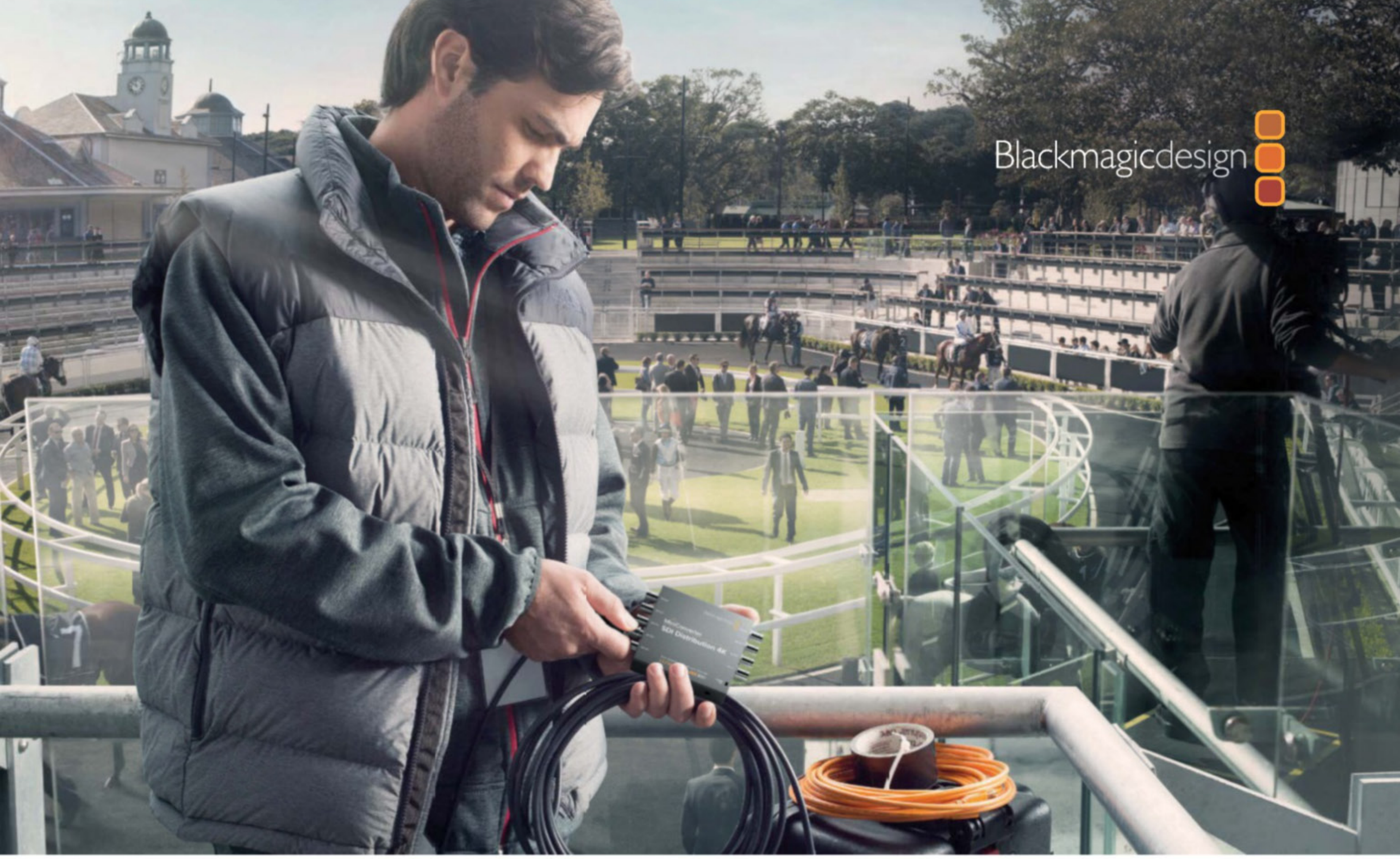
Maciej Drabik, *Asteroid Station*, 2014

MAKING THE MESH
The first thing was to create a simple block mesh. This is my standard conception phase and then I create 3D elements to lock my vision on the screen. Next, I add more details

MOVING ON TO PHOTOSHOP
This was the end of working in 3D. The grey render was imported into Photoshop and I worked on the shape details and added textures too

USING KITBASH FOR THE SPACESHIP'S UNIQUE SHAPE
I needed a spaceship for my scene, so I created one mostly from free Kitbash elements from **www.artstation.com/artwork/kit-bash**. This is a great way to find interesting shapes

POST-PROCESSING AND FOG
The last part of my pipeline was post-processing and I added some fog with the fog brush and Lasso tool, Color Balance, Levels, Sharpening, Aberration and Noise. This is the part where all the magic happens



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After working as general manager and senior VP at ILM, Scott Ross cofounded his own studio, Digital Domain, and oversaw it receiving Academy Awards for its VFX and proprietary software such as NUKE

Highlights at SIGGRAPH Asia

The best quotes from industry experts behind the most controversial, helpful and just plain hilarious talks at Shenzhen's SIGGRAPH 2014

Attendees of this year's SIGGRAPH Asia certainly had some impressive industry opinions and advice to look forward to. It all started with a controversial opening Keynote from former cofounder of Digital Domain, Scott Ross, delving into whether Asia could ever become Hollywood. Senior animator at Pixar Robb Denovan presented a speech on how a shot is animated from concept to final polish – explaining concepts such as Squash and Stretch, timing and anticipation, line of action, and of course, the importance of great acting. Professor of Computer Science at Columbia University, Steven Feiner, then gave his closing Keynote speech on the future of AR and user interfaces, exploring the possibility of a world where technologies more sophisticated than Google Glass are the norm. From the most shocking to the most helpful – here are the most exciting things we heard from Shenzhen's SIGGRAPH Asia 2014.

"China I think is in a very unique situation. It's a country with the biggest opportunity for box office in the world, and Hollywood, in my opinion coming from the inside, is broken."
Scott Ross, cofounder of Digital Domain

"Every character is essentially a bouncing ball. Whether it's the body stretching or head stretching, this needs to be involved. It feels like dough just being kneaded and pushed and pulled in squash to contrast with stretch – it feels really nice."
Robb Denovan, senior animator at Pixar

"AR and VR are really things that people look for and people know about, in part of course in the case of AR, because of Google Glass. We have had over 45 years now of augmented reality, so Ivan Sutherland in the early Sixties created the very first interactive 2D graphics program, Sketchpad. In a matter of just five years or so later, he published a paper that was on the very first head-tracked, head-worn display being used for both virtual reality and also augmented reality – looking not unlike a number of existing things that you can buy today. 1968 – that's over 45 years ago!"
Steven Feiner, professor at Columbia University

"Hollywood is an exclusive club. They might take your money, but they're not letting you in the club. Take Universal Studios and Columbia TriStar for example: two studios that were bought by the Japanese. Millions of dollars were spent on those studios during the acquisition. A good friend of mine from Matsushita [Panasonic] was the Japanese executive that was sent to run Universal Studios, and he and I (over many a sake) would discuss his ability to be able to manage Universal in the United States. Matsushita had almost no control over Universal. Even though they bought it, the people that ran Universal Studios were Lew Wasserman and Sid Sheinberg, the men that ran Universal for 35 to 40 years before they were bought. So the only thing that changed was the actual paper

ownership of the company, which was one of the reasons why they wound up selling."
Scott Ross, cofounder of Digital Domain

"You don't want to just film reference and copy that – anyone can do that! You want to exaggerate it. You want to put something in there."
Robb Denovan, senior animator at Pixar

"China has changed. That's a bit of an understatement! This is my fourth journey to China in the past ten years, and each time I come back I've come to a different China. The energy that you get from particularly younger people in this country reminds me of what San Francisco felt like in the Sixties, or what New York felt like in the Fifties. China has clearly come of age and is making a major impact on the world stage."
Scott Ross, cofounder of Digital Domain

"Nowadays a lot of what you see in the AR world is stuff you hold up in your hands, like smartphones or tablets. All the things you need to be able to do the video see-through, you need in a virtual world. But your hands are still busy; they're holding something they normally wouldn't want to hold."
Steven Feiner, professor at Columbia University

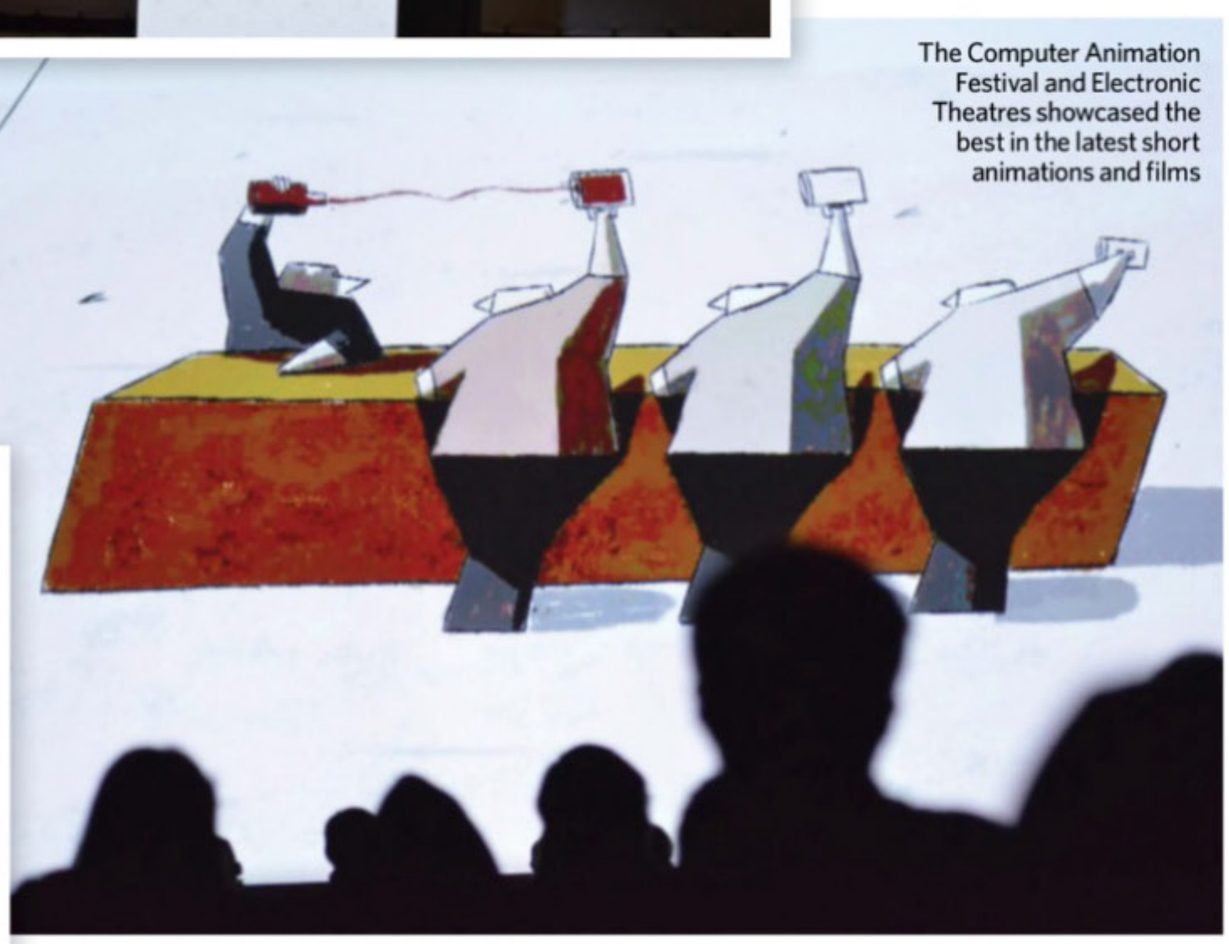
"In my 30 years of experience working with studios, the heads of every studio – including the presidents of production for every studio, do not know how to make a movie. I'm not talking from a creative point of view, but purely a technical point of view. They don't understand how moviemaking works; many of them are lawyers and many of them are agents. They aren't film-makers."
Scott Ross, cofounder of Digital Domain

"Silhouette is another great tool. I look at this and I can tell exactly where his hands are, the way his head is turned – I can see everything about that pose. Appeal is one of the last things but it's very important!"
Robb Denovan, senior animator at Pixar

"A smartwatch is a good example of wearable computing, whether you may have a Samsung or LG smartwatch – some of you may be waiting for the thing that Apple are going to be releasing at some point. So we're going to be seeing a lot of smartwatches, even more than we have right now. But to get AR that is wearable, maybe the best place to make AR that is wearable easily all the time is on something that's going to be on your face – in the form factor of eyewear."
Steven Feiner, professor at Columbia University

TOP The opening ceremony at this year's SIGGRAPH Asia in China. It included the introductory Keynote speech from Scott Ross and the awards ceremony too

LEFT, BOTTOM LEFT Robb Denovan and Steven Feiner gave talks about how to animate at Pixar and the future for AR technology



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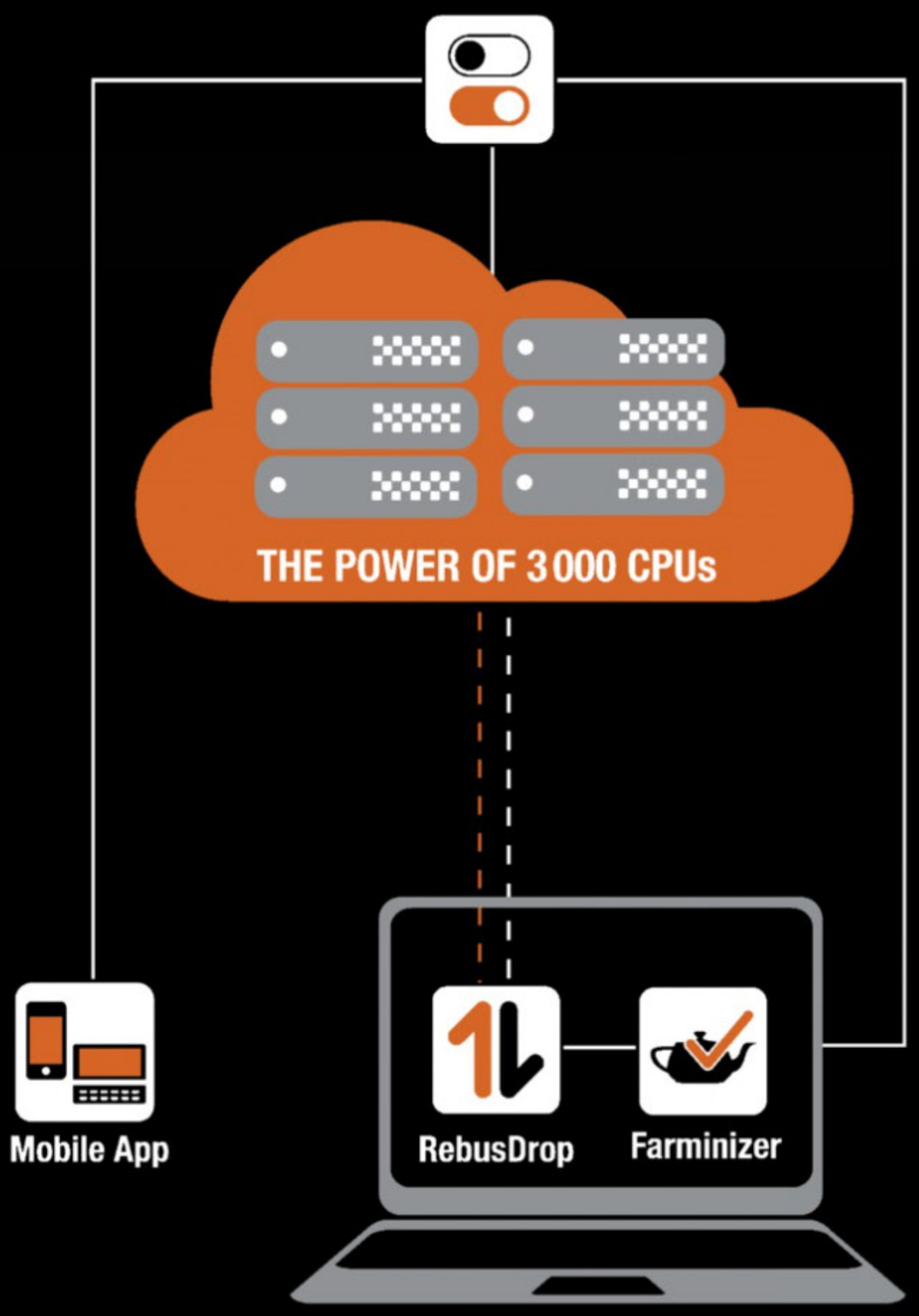

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SIGGRAPH 2015 will be held in Los Angeles from 9-13 August this year, while SIGGRAPH Asia will be held in Kobe from 2-5 November

Upcoming SIGGRAPHs

What to look forward to at the 42nd international conference and exhibition in LA and SIGGRAPH Asia 2015 in Kobe

Xroads of Discovery

9-13 August: the 42nd SIGGRAPH Conference

The 42nd annual international SIGGRAPH conference will be held at the Los Angeles Convention Center this year – the set of hundreds of commercials, movies and still-model shoots as well as the same location that was used for SIGGRAPH 2012 with 44,750 square feet of exhibit space.

The five-day event in the heart of the City of Angels will take attendees to the top tourist destination near plenty of historical attractions, amusement parks and beaches, as well as plenty of VFX and animation studios including Method Studios, Digital Domain, Walt Disney Animation Studios, DreamWorks, Blur Studios and more.

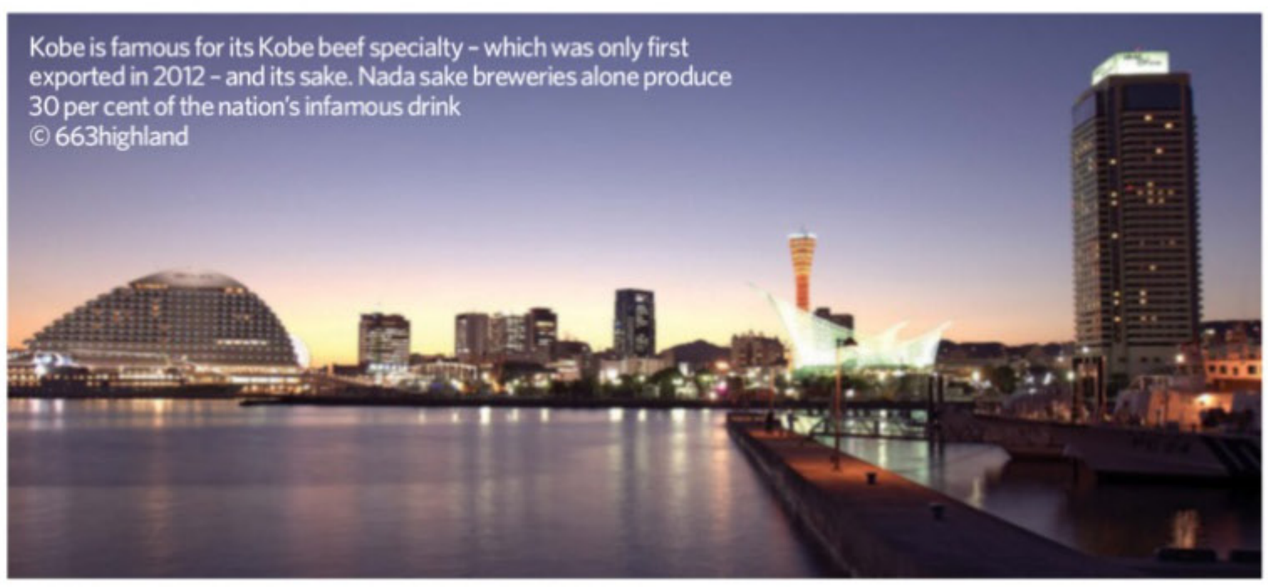
CG in Japan

2-5 November: the 8th ACM SIGGRAPH Asia

This year, SIGGRAPH Asia will take place from 2-5 November and, excitingly, will be held in the port city of Kobe, in central Japan. Kobe is famous for its succulent beef and delicious local sake as well as being very close to one of Japan's three oldest spa resorts, Arima Onsen. It's also easy to get to via the nearby airports: Kobe Airport, Kansai International Airport and Osaka International Airport. Kobe is also the home to more than 60 large and small convention facilities, with the ability to cheaply and easily host conferences and conventions attended by up to 10,000 people.

It's no surprise then, that according to SIGGRAPH Asia 2015's official website at **sa2015.siggraph.org**, this conference is actually anticipated to be the largest SIGGRAPH Asia event organised since its debut when the very first one was held in Singapore in 2008. The only other SIGGRAPH Asia that has ever been held in Japan, 2009's event in Yokohama, also proved to be a runaway success with a high turnout being reported months beforehand.

SIGGRAPH
ASIA 2015
KOBE


Kobe is famous for its Kobe beef specialty – which was only first exported in 2012 – and its sake. Nada sake breweries alone produce 30 per cent of the nation's infamous drink
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Images of the month

These are the illustrations that have been awarded 'Image of the week' on 3DArtistOnline.com in the last month

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Ⓐ Ferrari Enzo
» **Khaled Alkayed**
3DA username khaled_alkayed
Khaled says: "This image is a personal project, and I used Maya and Photoshop to create it. I tried to pay attention to small details of the model and the addition of a variety of ideas."
We say: *This is a really intricate imagining of a supercar, and the sort of vehicle that wouldn't be out of place in Mad Max with its tyre chains and armour plating. The reflective painted surface only elevates this dystopian, almost steampunk look. The rockets are a nice touch, too.*

Ⓑ Oreo Breakfast
» **Antonio Pedro Barata Mira**
3DA username Antonio Mira
Antonio Pedro says: "I just woke up one day and decided to model one of my favourite cookies, so this is my attempt. I used 3ds Max, V-Ray and Photoshop to create this image."
We say: *Everyone likes cookies, and Antonio has done a fantastic job of replicating the Oreo's look and texture for this image. It's quite a complicated texture to achieve, but Antonio has succeeded admirably here, and that glass of milk really does look delicious...*

Ⓒ Valkyrie
» **Rhenan Fidelis**
3DA username Rhenan Fidelis
Rhenan says: "I quite like Norse mythology, so I decided to create this character based on a concept by an illustrator called Ziro. Painting the textures proved to be a big job, and compensation in other areas improved my workflow."
We say: *We love the subtle cartoon vibe here, and Rhenan has done a wonderful job of developing some realistic textures for the armour plating and leather components. A great piece of fantasy work.*

Ⓓ Final Mirage
» **Ariane Momeni**
3DA username Ariane Momeni
Ariane says: "With this work I wanted to create a clean and bright render of a scene that had a modern, yet classic feel to it."
We say: *This is a great example of the truly artistic side of arch-vis, and we love the run-down, bohemian look that Ariane has achieved here. What also works really well is the inclusion of art within the art – we love the mask and canvas print in the background.*

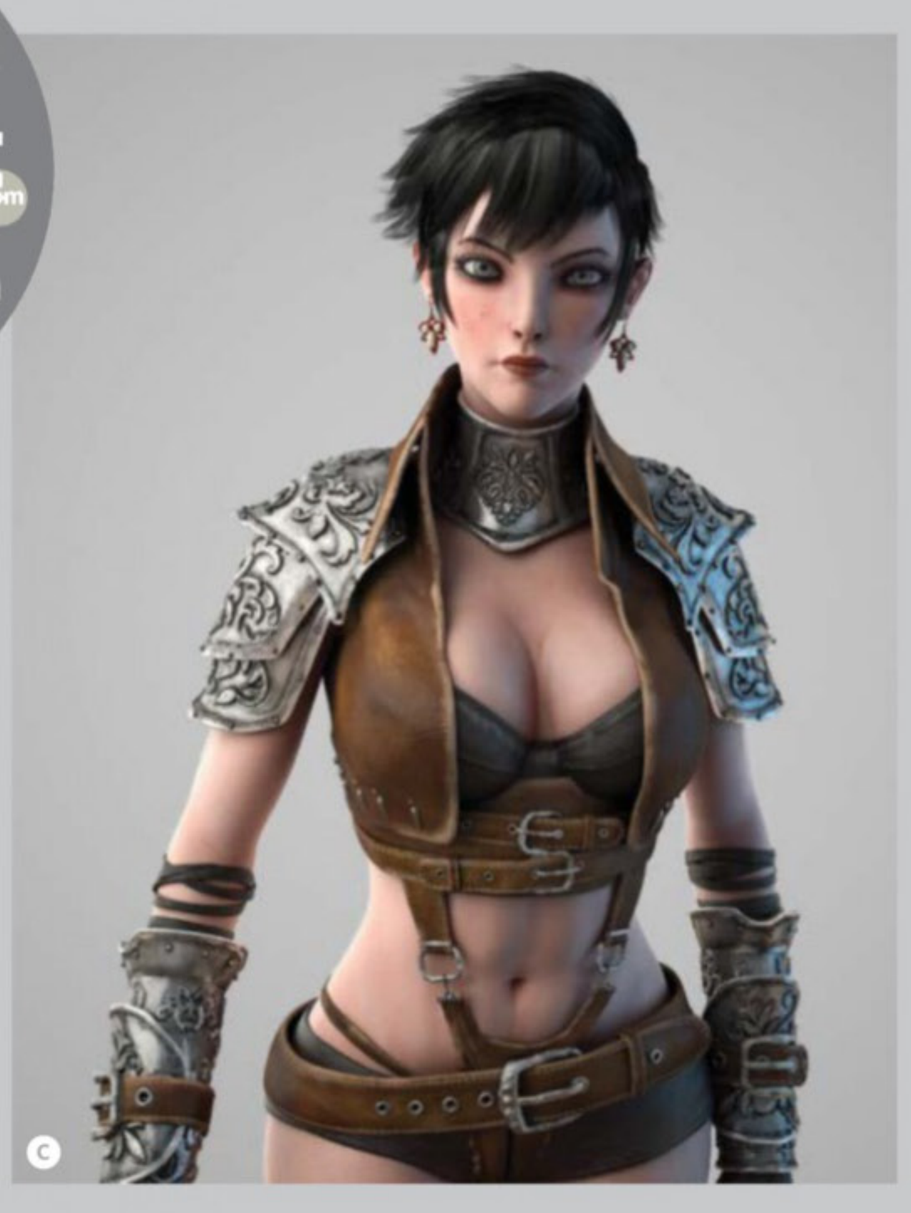


Image of the month

B

D

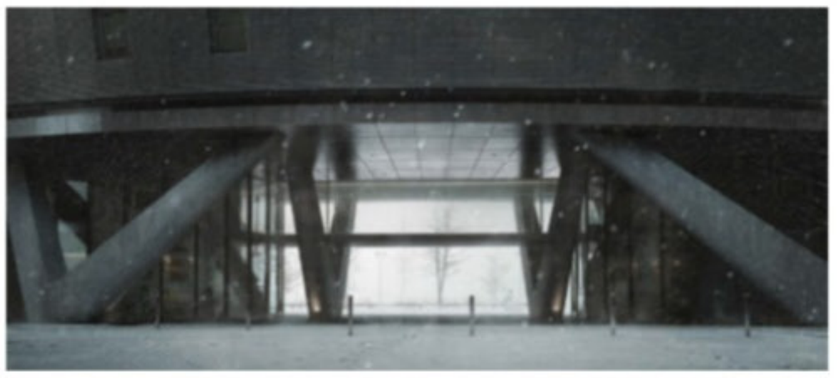
Wine Dance

» **Shamim Reza**

3DA username razee01

Shamim says: "These are dancing figures flowing through the wine... Models were done in ZBrush and 3ds Max, the wine was made with RealFlow and rendered with V-Ray."

We say: *This is such a lovely concept, and the execution is accomplished as well. It's such a simple, elegant idea too. The models are so delicate it could be a watercolour painting, and we think that Shamim has developed a really lovely style.*



Albion Riverside

» **Tamas Medve**

3DA username m3dve

Tamas says: "I was working in London at Foster & Partners when I made this. This building is also designed by Foster and 20 metres from the office. I walked past it almost every day – I have good memories of this place..."

We say: *We've featured Tamas before and are pleased to do so again as his attention to detail, not just in his arch-vis models but in the wider environment that they're part of, is incredible. Superb work.*

Wintertime Hunt

» **Bartosz Domiczek**

3DA username Bartosz Domiczek

Eduardo says: "This hunt scene was created as a part of my personal project. I've focused on murky, fin-de-siècle venatic themes presented in interiors, exteriors and still-life setting."

We say: *We love this image – Bartosz has developed such a bleak atmosphere that neatly emulates his fin-de-siècle inspiration, and the hint of arch-vis in the background is stunning. It's very much the sort of image that you can get lost in.*

Diamond Ring

» **JOMAX**

3DA username JOMAX

JOMAX says: "I was interested in rendering complex IOR and hyperrealism, and the result is this image. The actual object is my friend Vrinda's Ring. I used LightWave 3D with the Maxwell Render plugin to render this image."

We say: *It's often useful to have your inspiration to hand. This is an excellent model, and the depth-of-field effect makes it look like a photo of a real ring.*

EXPERT GUIDE TO MODELLING

We discover how the best professional artists working today create their unique designs for vehicles, robots, realistic humans and more in 3D

When Fausto De Martini was first introduced to the world of 3D, he was writing articles for a games magazine in Brazil. "We eventually hired a guy that made a little introduction of the company logo in 3D. I asked him how he did it, and he said he used 3ds Max," De Martini begins. "That was the first time I met someone who was doing 3D stuff at home."

The revelation changed De Martini's life for good. Falling in love with 3D, he began learning how to use Max himself, eventually getting into the advertising industry. CG for advertising in Brazil at the time was mostly about making elements like generic flying logos, and not the sci-fi and fantasy characters, spaceships and robots De Martini had been passionate about since childhood. A huge fan of the work on *StarCraft* from his time at the magazine, he decided to take a risk and go for a very big fish: working at Blizzard Entertainment.

De Martini worked harder than ever before to make this new goal a reality. Using any spare time he had after working on his job, he began work on creating a personal *StarCraft*-inspired space marine character every night until the early hours of the morning, hoping that he could develop a full animation from the piece. He hadn't even finished the project, however, when a friend urged him to post the piece on CGTalk.

"At first I was reluctant because it wasn't finished, but one day I just woke up and decided to post whatever I had. I posted it saying that I loved Blizzard and at some point I'd love to get a job there, and this marine was what I'd been working on," he remembers. "The next day a friend of mine called me and said I should check out CGTalk. My image was featured on the front page. I checked my email and I had six or seven job offers from all over the world. It absolutely blew me away."

De Martini then became the lead modeller on the *StarCraft* cinematic and worked at Blizzard for ten years. Today, he's still in the US, modelling 3D designs as a concept artist and illustrator for films like *RoboCop*, *Transformers 4*, *Star Wars: Episode VII* and the *Avatar* sequels. It all began from something as simple as starting that first mesh.

From creating unique sci-fi to hyperreal humans, futuristic vehicles or terrifying creatures, modelling your own 3D designs is definitely a sure-fire way to get the public's attention. To discover more, we spoke to 11 of the best industry professionals modelling their creative ideas today to reveal the secrets of how it's all done.

> "The key is to be extremely passionate about what you do and try to better yourself at every opportunity. Never be satisfied with the work you did yesterday"
>
> **Fausto De Martini**

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SCI-FI & MECHS

FAUSTO DE MARTINI

Your career and job is something many people dream of! What does it take to be a freelance concept artist today?
I think it comes down to trying to do as much art as you can in your own time. Whether you're coming out of school or are from a whole different country, if you're doing your own work and your own thing parallel to your job or to your schoolwork, it's going to make your portfolio that much stronger. The key is to be extremely passionate about what you do and try to better yourself at every opportunity. Never be satisfied with the work you did yesterday.

Could you give a short description of your typical workflow when creating your designs?
My favorite tool right now is probably V-Ray. I think V-Ray changed a lot of things. It's a pretty powerful piece of software to do very good lighting, but also the amount of geometry it can take makes it a very solid renderer for concept art.

How complex did the geometry get?
In some environment scenes for *Transformers* I had to generate around 100 million polygons. It could get pretty heavy!

"When I got my job on *Transformers* I was contacted by the production designer. He had just come across my blog and had seen all of my personal work," remembers De Martini. "So I never landed that job using my work for previous companies, it was using my personal work. The same with my job at Blizzard - it was my space marine, my personal work, which got me the job"

FAUSTO'S PIPELINE

ZBRUSH

"It's not a very large set of tools that I use, but these are the most effective ones for me"

■ **The Standard Brush** I use this to make very simple overall volumes.

■ **Clay Buildup Brush** For the most part I use the Clay Buildup brush. It has such a good response to it that you can build up shapes very fast.

■ **The Clay tool** The Clay tool is also really good for these types of results.

■ **Dam_Standard** Another I use a lot is Dam_ Standard, for sketching out shapes very quickly.

■ **Snake hook** I like Snake Hook. It's a more progressive brush, so when you're pushing geometry around you can get a better speed. It feels more dynamic than the Move tool.

■ **High Polish** This is great for really hard lines.

■ **Curve Tube Brush** Another I use quite a lot is the Curve Tube to generate extra tendrils. You can create a body or limbs using Curve Tube super quickly.

■ **Panel Loops** Recently I've been using more and more Panel Loops to create very sharp lines and uniform contours. It's pretty fantastic.

■ **Clip Curve Brush** Clip Curve is really good if you need some really sharp cuts on your model.

3DS MAX

"This process of working is something I apply for almost everything I do"

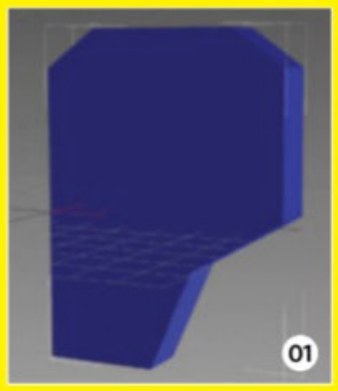
Having perfect geometry with perfect quads – that's not an option. This isn't production modelling. It's for design, and for design you have to cut corners and do everything fast. In 3ds Max I developed this process on my own where I use a lot of planes to help. I found this gives me greater control over how hard or soft I want something – it was especially useful for my work on *RoboCop*, where the heaviest modelling work I had to do was for the suit.

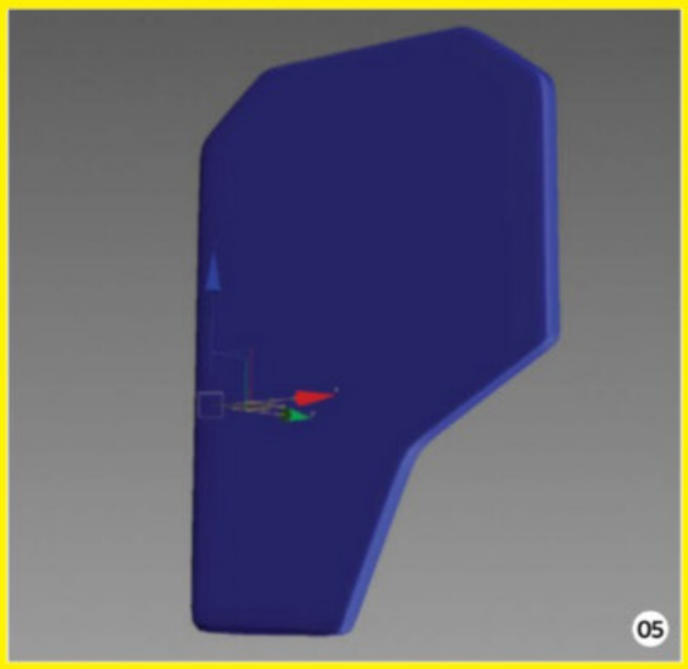
■ If I need to do an armour piece, for example, I'll start with the Line Tool. I'll then apply Extrude, I convert to an editable poly, and then I delete all the backfaces. This gives me a flat mesh.

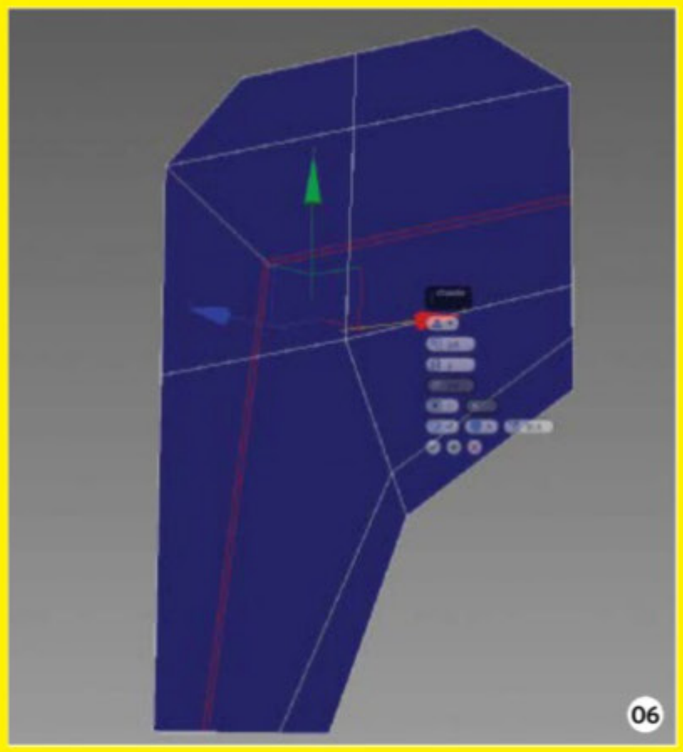
■ I then push the points around, add more edges to get the shape that I want and then I will apply the Shell Modifier.

■ After I apply the Shell Modifier I use a MeshSmooth modifier, then I choose the MeshSmooth Classic, and change the Strength setting of the smoothing parameters. What that then gives you is an automatic Chamfer on everything. It's actually pretty cool – it almost does something like what the new Quad Chamfer is capable of – though the way you control it is a little different.

■ When I apply that modifier, I then apply another TurboSmooth on top. This gives me a smooth geometry that kind of looks like I spent a lot of time time doing Chamfering on it, but because I was using this technique and it's all live on my stack modifier, every time I need to add to it I just come back to the lowest level, which is an editable poly, and change the geometry however I want. Then, when I come back to the top level, the result is already there.







This dragon piece by Mariano Steiner was the result of a friendly challenge with other artists, revolving around a medieval theme. The model was created in ZBrush, retopologised with TopoGun and fully sculpted and textured using ZBrush and Photoshop. Rendering was done using 3ds Max and V-Ray

MARIANO STEINER

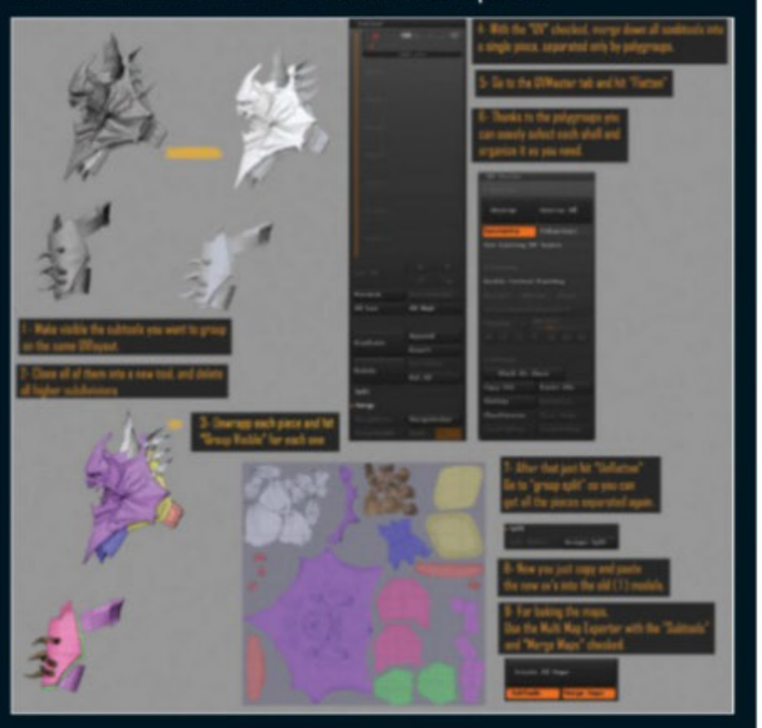
USING DYNAMESH EFFECTIVELY

Using both Dynamesh and ZRemesher together makes modelling feel like a much more organic, painless process. Some people use Dynamesh all the way to the final model, but that gives you a superhigh polycount model, with terrible mesh control and viewport speed.

I prefer to use it just as a blocking tool. Once I set up my proportions and main shapes, I use ZRemesher to make sure I have a clean and well-distributed topology. That gives me a nice low-poly mesh and more control when doing changes on the model, unwrapping, texturing and rendering in another application, as well as an optimised file to work on.

CREATING UVS

Here I have made the UVs for a demon-like creature based on artwork by Fenghua Zhong. ZBrush, Photoshop and Marmoset were used to create the final piece.



CREATURES

KURT PAPSTEIN

"When I started I didn't actually care for 3D too much," reveals Papstein, explaining that his love for fine art turned into a love for digital art and Photoshop in high school, where he first dabbled with free 3D software. It was only towards the end of college that he discovered early versions of ZBrush and Mudbox. Eventually focusing on a pipeline that utilised ZBrush as much as possible, Papstein started working as a character artist in games and creating concept artwork for films.

Which toolsets would you say are essential for creature creation?

ZBrush offers a lot of versatility for all types of character art. For creature exploration and iteration I tend to use brushes like Spiral and Twirl to create big expressive shapes. It's like grabbing a handful of clay on your base sculpt and pulling and twisting. I like to use brushes like these that facilitate a stream of consciousness, letting things present themselves, force happy accidents and let your subconscious knowledge of anatomy and biology take over.

Is there any essential background knowledge or training it would be better to undertake before starting on a creature?

You can never have enough reference or documentaries around you. Don't get caught up on what you like, explore the animal kingdom and prepare to incorporate new things into what you do. Study locomotion and movement, understanding how animals move is extremely important.

A great background to this kind of work is drawing. Go to the zoo and be comfortable with drawing the animals and what you see. While you're doing this, think a lot about how things are connected, related, and built in three-dimensional space while you're drawing them. Get comfortable working from something simple like a sphere and completing a rough sculpt in under an hour. Understand all of the tools at your disposal and how they work together to increase productivity.

Ryan Kingslien's 8HeadFemale model helps get modelling work started. Others in the ZBrush library are also helpful – they are under the Lightbox menu.

Can you give us a short description of your typical workflow when modelling in ZBrush?

A lot of what I do is based on finding shapes, those forced happy accidents. I sculpt a lot of the major forms by hand and then the medium forms. When a majority of the sculpt is there I run over it with Alphas to build the texture across the entire surface.

I then turn to smoothing some of it out with Smooth Peaks to control some of the details so it's not overbearing, after which I will hand-sculpt some of the details with Dam_Standard and Clay brushes to give it that hand-finished look, removing the overdone photo reference feel.

The final step is to hit it with some noisy Alphas and Color Spray, so that the surface is no longer smooth and finished and has grit to it.

> "A lot of what I do is based on finding shapes, those forced happy accidents. I will sculpt a lot of the major forms by hand"
>
> **Kurt Papstein**

"Hopefully in five years time I will be doing more of my own work and making a living from producing my own IPs and products," says Kurt Papstein. "It feels like a long shot but it's what I've geared my personal art towards, the same way my personal art was focused on concept and film work"

NUTTAVUT BAIPHOWONGSE

BEST BRUSHES FOR SCALES

The brushes below were used to create scales for Siamese Dragon Horse, a creature based on Thai mythology by Nuttavut Baiphowongse, who comes from Bangkok. "After I did the scale map, I picked the direction and a path, put the tail on that and textured over it in Photoshop," he explains.

Expert guide to modelling

HUMANS

SEUNGMIN KIM

Based in South Korea, Seungmin Kim is currently the instructor and keeper of a private institute for the CGNI game graphic school (**www.cgnischool.com**). He is also working on game development as a lead character artist at Wiple Games (**wiplegames.com**) and works as a freelance artist.

How long did it take to become this good at creating human characters?
It has been 15 years since I started CG. I kept working on 3D everyday as a hobby. Since I have been studying 3D for the past 15 years, I believe that it is only natural for me to have improved. Of course, I still have much to improve yet.

What made you decide to use 3ds Max and ZBrush in your modelling workflow?
3ds Max is what I use for hard-surface modelling, V-Ray I use for rigging and particles, ZBrush is used for adjusting the details and forms of the work, such as the broken armour or pose of a character.

It is feasible to create a desirable result only with ZBrush. However, more than 90 per cent of my work has been completed using 3ds Max.

Can you tell us more about your workflow for creating hair and fur on your models?
I use the Hair Farm plugin (**www.hair-farm.com**). In addition, I started using FiberMesh in ZBrush. To create the hair and fur on my Knight piece I would:

- Manufacture the areas in need of fur by using 3ds Max and ZBrush
- Make the hairstyle with FiberMesh in ZBrush
- Export hair with FiberMesh through OBJ
- Import the OBJ file into 3ds Max and extract spline by using the Fibermesh to 3dsMax Spline script (from **www.norman3d.com/FibermeshTo3dsMaxSpline/**)
- Apply Hair Farm Modifier on the extracted spline
- Combine various hair farm modifiers on the Hair Farm and create one particular style
- Confirm the thickness and color through rendering tests. Then test this until the preferred result is obtained.

SEUNGMIN KIM

FOUR MOTTOS FOR GREAT CHARACTER CREATION

1. Don't be hasty CG work requires effort and several months or years until your hands perfectly coordinate with what your brain orders you to do in 3D.

2. Keep observing Most of the images in your brain are deformed. Even if you are aware of this, you should always observe the world around you more.

3. Rest is needed Most of the people doing CG work do it because they like it. But, if you are physically tired, you might get poor results.

4. Do not see the completed work for several days before finalising it The piece you are familiar with is often very different from the piece you successfully make. Being familiar with the work is the most dangerous situation for the work you complete on your own. If you can, rest for several days and then afterwards, objectively determine the quality of it.

RIGHT For creating clothing, Seungmin Kim used 3D cloth simulation program Marvelous Designer (**www.marvelousdesigner.com**). It was developed to create real clothes, but it's applicable to all areas that are made of fabric

BOTTOM "Characters can reflect the artist's sense and preferences. Realistic vehicles or weapons must exclude the artist's intention as much as possible," reveals Seungmin Kim

"I used to be the type of guy who wanted to always choose an old, familiar workflow, but ZBrush really taught me how beneficial new features can be"

Arash Beshkooh

BORISLAV KECHASHKI

ZBRUSH & 3DS MAX

"Here is my approach for almost every type of clothing I create"

1. I usually start by roughly masking the shape of the cloth over the character's body. I then use Extract to make a new mesh on which I delete everything except the outer faces (they come as separate polygroups after the extract, which makes it very easy to isolate and delete hidden).

2. At this point I ZRemesh my model so that I can have more pleasing topology to work with. Using the move brush and by ZRemeshing, when required, I try to establish the form I need. Working with a one-sided mesh makes it a lot easier at this point.

3. When I'm happy with the main forms and the silhouette, and before further detailing, it's time to give it thickness. The way I usually do this is by exporting my mesh to 3ds Max, where I use the Shell Modifier. I keep the segments to one, even if I want sharper edges. I'll later use crease in ZBrush so that I don't end up with stretched polygons in the thickness area.

4. I make sure that the Select Inner Faces option is checked in the Shell Modifier, so that I can easily separate the inner polygons from the outer ones and the polygons across the thickness on different UV islands, which I'll later use in ZBrush to make polygroups by UV (Auto Groups With UV).

5. Once the polygroups are done in ZBrush, I use Crease PG, then I subdivide it once (or more times if you need a sharper edge). Next, UnCreaseAll and subdivide it some more times to soften the edges. That way you'll have nice sculptable geometry even on the edge and with less polycount. Now I can begin adding all the other details.

6. Separating different UV islands and making polygroups out of them also comes in handy for parts that overlap one another or are very close and therefore difficult to work on. This way it's very easy to isolate the part you need to work on.

Concept by Marko Djurdjevic

ARASH BESHKOOH

Arash Beshkooh first became interested in 3D by playing video games during childhood, before starting to learn 3ds Max on his own as a hobby. After choosing to work using 3D in his career, he discovered ZBrush and has been using a ZBrush-based workflow for his work ever since.

How did you start sculpting anatomy in 3D?

When I discovered ZBrush it was a whole new world of modelling with lots of new tools. Then I read an amazing anatomy book, *Atlas of Human Anatomy for the Artist* by Stephen Rogers Peck, and started sketching people, figures, faces, characters, creatures and more. It helped me when it came to understanding organic shapes. I don't think I could be interested in this job if I didn't know ZBrush.

What is the typical polycount you have for your final characters?

My models usually have around 5 to 20 million of polys in total, and for subtools it won't go higher than three to four million. Sometimes I only subdivide the areas that are necessary, like the face, to keep the polycount as low as possible so that my computer can handle it!

What are your favourite ZBrush tools?

Dynamesh is an amazing tool that helps me create any form and shape without restriction. It's a dream for any modeller!

Another tool that really reshaped the modelling process for me was the ZRemesher that completes the aforementioned tool. I used to be the type of guy who wanted to always choose an old, familiar workflow, but ZBrush really taught me how beneficial new features can be.

If you could give us five important tips for sculpting in ZBrush, what would they be?

- **Test lighting and material conditions** Something I've found very useful is checking the model under various lighting conditions and with different materials. This really helps you to have a better understanding of what you are sculpting.
- **Use various references** For the clothes, anatomy and more, references can be very helpful to improve your sense of realism. Remember, the key to using references is to learn from them, not just use them as a model sheet!
- **Sculpt the face right** A point about sculpting the face that I realised while doing it myself is that it's useful to see the face as a whole, not separated elements. The eyes are normally noticed first, so there should be a lot of effort put into doing them.
- **Don't get stuck sculpting all the minor details of the character** The most important part of a realistic character is the basic forms, so put much more effort on making the forms and less on details. Start by making the silhouette and the basic forms in low subdivision and work until you are satisfied, then go for more subdivs and details.
- **Last but not least, I always prefer not to start with a complete base mesh** For blocking the model, good topology should be uniform and quad. For a human for example, a simple base mesh without topology for the eyes, mouth and nose, is preferable, or you can use Dynamesh in ZBrush as well. This way you can change and play with your model much more easily, without any limitation. After you are satisfied with the main forms, you can use ZRemesher or retopologise it by hand and then add details.

MALE RENDER by Arash Beskooh

I think the key for sculpting realistic folds and wrinkles is to study fabric and cloth's behaviour: the compression, expansion and bending. I mostly use Standard brush and then what I do is I will try to keep the subdivision level of the model based on the type and the size of the fold that I know I'm going to be working on. This way it's much easier to control my mesh and makes using the Smooth Brush much better too.

To create this male character's hat, I used a sphere in ZBrush: it has a squareish UV which enabled me to use NoiseMaker (**pixologic.com/zbrush/features/NoiseMaker**) for texturing. In the NoisePlug I used the corrugated option and what I did was I set the wave shape to Ribbon. I then applied this to the mesh. I had a tileable map for the fibre texture, and again I used NoiseMaker to apply that same texture. I also used the ribbon noise to mask the lines and generate some depth variation for the fibre texture.

Expert guide to modelling

"I'm a really old-fashioned modeller," says Anton Podvalny. "From time to time I use different tools, such as splines in 3ds Max, sculpting in ZBrush, or small scripts such as Regularize, but in most cases I work with polygons and edges in Max"

VEHICLES

ANTON PODVALNY

Ukrainian 3D environment artist Anton Podvalny first became interested in CG in 2010, when his friend began to learn ZBrush. "After three months of training I tried to make my first model and it was horrible! I went back to studying and only two years after, I began to create works that did not cause cognitive dissonance," he jokes.

What do you feel are the most crucial techniques to modelling a great vehicle?

- If you are trying to make a vehicle of your own design you should start with doing some research. Find some decent examples from different time periods and then make sure that you study them carefully: basic forms, details and materials. Even learn their stories of creation and purpose, it's like writing a script – your character must have a backstory to feel real.
- Remember that with vehicle design, sometimes the line drawn between the artist and the engineer can get blurred. Try to base your mechanisms on real-world examples and the result will look more solid and realistic.
- Be sure to make your vehicle in real-world scale if you want correct lighting and realistic results.
- When you're done with research make a rough silhouette of your vehicle, just to see if it works for you. If you don't like something in shape of your vehicle at this stage, change it, don't hesitate.
- With vehicle creation I spend a lot of time making a decent silhouette in Photoshop and basic 3D forms in 3ds Max. That is one of the most important stages for me and then if I'm finally satisfied, I start to quickly create all the details, I never sketch them first.
- When you're making a vehicle, I think it's also important to establish good topology. Of course, there can be cases when you can neglect this, but overall, it's good to have a neat topology – in the future it can save you time if your model needs radical adjustments.

Do you have any favourite tutorials or learning websites you feel other 3ds Max modellers should know about?

I've seen a lot of tutorials, so I can definitely say that tutorials from Digital-Tutors are the best for every beginner artist. Also, Gnomon Workshop provides a lot of valuable tutorials for experienced artists. There is also Grant Warwick, an amazing artist from Australia, with his famous modelling tutorials that every beginner has to see.

How did you create the Armored Vehicle?

I have always loved military vehicles, and Armored Vehicle has a special meaning to me. I began this scene a long time ago, but unfortunately I was not experienced enough to handle it in a proper way. I think it was my longest work in progress.

There are a lot of objects in the scene, but the actual polycount is really small (only 5 million polygons) and that's all because in most cases I didn't do any modelling with subdivisions – Chamfering edges was satisfying enough.

I used the graphite modelling tools in 3ds Max to create this piece – they are very flexible and efficient. This vehicle has a lot of hard edges, so it's not difficult to model it with only polygon and edge extruding methods. Even if it was some sort of sports car with extremely smooth surfaces, I'll still (preferably) only use graphite tools.

I think the only challenge in modelling this scene were just in a few places where I really ran out of ideas and I then had to go through additional research and sketches.

> "With vehicle design, sometimes the line drawn between the artist and the engineer will get blurred"
>
> **Anton Podvalny**

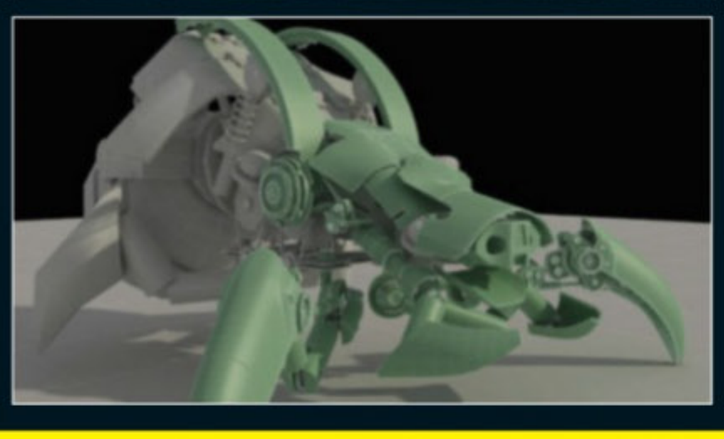
McLaren F1 by Carlos Pecino, or colorsponge. He was first introduced to 3ds Max by a friend at the age of 15

TIPS AND TRICKS FOR CREATING CARS

TAMAS GYERMAN

"I'm Hungarian and now 27-years-old. During childhood, I was interested in drawing and when I was about 12-years-old, I was first introduced to Cinema 4D. I still use Cinema 4D today, along with a little ZBrush. My models are created with polygon modelling, built up loop by loop. I only work with traditional tools like Extrude, Inset (inner Extrude) Bevel and Cut."

Tamas Gyerman's Hellion has many functions, like a napalm tank for example



- First, you have to choose whether your vehicle is railing, sailing, rolling or flying. This is actually very important for the overall shape. I normally think about how it will affect plate thickness, aerodynamics and propulsion.
- I think a good vehicle design works in CG if it can be built in real-life. Keep it realistic, and construct the inner structure at the very least in a very raw, basic form.
- Remember to think about the shape. It's not important how powerful, shiny or otherwise superb your machine may be if it doesn't seem to have any weight or mass.
- You need to find the good balance when you design parts between realism and creation. The environment and the image ratio helps to further 'sell' your ideas.
- The details are important, but the size is much more so. You ideally should normally have to always present a few fixed-sized parts from the real-world that people can relate to.

CARLOS PECINO

"This obsession for the cars comes from way back; as far back as I can remember I've been drawing all kind of cars. In the future, I would like to be part of the motor advertising world and I won't stop until I reach my target. I normally use 3ds Max and ZBrush."

- Begin with basic splines for the main surfaces and to define the vehicle shape.
- Have these basic splines as a reference to begin using editPoly and MeshSmooth. Model each part independently: hood, doors, lights and so on, but pay special attention to the little details like headlights, door joints and glass areas.
- Make use of websites like the Car Blueprints forum SMCars (**www.smcars.net**), where you can find the best car modellers. You can learn a lot and get inspired by their Showcase and Work In Progress sections.

Technique focus

Incredible 3D artists take us behind their artwork

SCULPTING I focused on sculpting wrinkles as it was the purpose of this project. I used Standard, Move, Clay Buildup, Dam Standard and Slash brushes to try to portray every single shape of the head. Then I added Alphas on top. After that I added more details over the Alphas to break regularity. Finally, I retopologised it, exported and rendered in KeyShot. **Old Man Bust,** 2014

Kwangbae Byun

3DArtistonline

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Website
www.cgbyun.blogspot.com

Country USA

Software used
ZBrush, KeyShot

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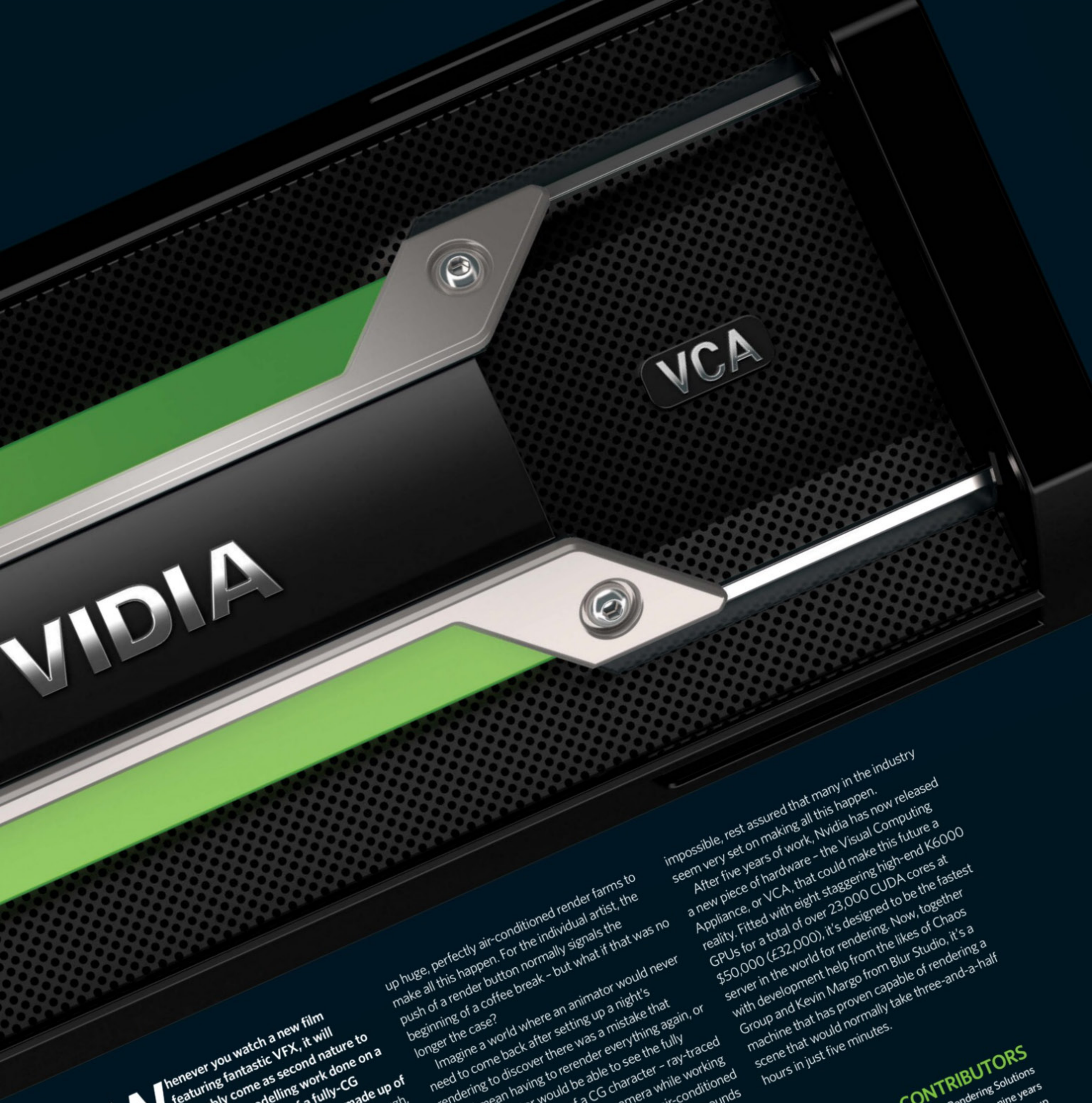
THE FUTURE OF RENDERING

We talk to industry experts from Blur, Nvidia and Chaos Group about the hardware and software that could eradicate render time for good



Whenever you watch a new film featuring fantastic VFX, it will probably come as second nature to admire the incredible modelling work done on a digital double, the animation of a fully-CG creature or a stupefying FX explosion made up of billions of particles. What's less common, though, are any thoughts towards all of the rendering work it took to get there.

Today, the rendering process remains a crucially important part of any CG pipeline, closely dictating not just how the final frames will look but the amount of time an entire film's production will take. Visual effects studios spend thousands on setting up huge, perfectly air-conditioned render farms to make all this happen. For the individual artist, the push of a render button normally signals the beginning of a coffee break – but what if that was no longer the case?

Imagine a world where an animator would never need to come back after setting up a night's rendering to discover there was a mistake that would mean having to rerender everything again, or where a director would be able to see the fully finished final renders of a CG character – ray-traced in 1/30th of a second – all in-camera while working with actors in mo-cap suits. Imagine air-conditioned render farms disappearing altogether. If this sounds impossible, rest assured that many in the industry seem very set on making all this happen.

After five years of work, Nvidia has now released a new piece of hardware – the Visual Computing Appliance, or VCA, that could make this future a reality. Fitted with eight staggering high-end K6000 GPUs for a total of over 23,000 CUDA cores at $50,000 (£32,000), it's designed to be the fastest server in the world for rendering. Now, together with development help from the likes of Chaos Group and Kevin Margo from Blur Studio, it's a machine that has proven capable of rendering a scene that would normally take three-and-a-half hours in just five minutes.

CONTRIBUTORS

PHILLIP MILLER / www.nvidia.com / Product manager for the VCA, general manager of Advanced Rendering Solutions
KEVIN MARGO / www.blur.com / VFX/CG supervisor at Blur for over nine years
LON GROHS / www.chaosgroup.com / Chief commercial officer at Chaos Group

The future of rendering

NEW TECHNOLOGIES

For Chaos Group, the potential of the technology behind the VCA was very much evident before the VCA had even been released. "Nvidia's a close collaborator and technical partner, so we were constantly testing their new hardware and making sure that V-Ray RT is taking advantage of all the speed of the new systems," begins Lon Grohs, chief commercial officer at Chaos Group. "They then wanted us to take a look at a new piece of hardware, the K6000, which in our minds was opening the door to what we were calling final frame rendering using the GPU."

The use of GPU processing had been steadily increasing in the industry, and the idea of final frame rendering using it presented an exciting prospect not just for rendering speed, but for interactivity. "People have been showing cluster rendering for many years and usually this happens on big CPU farms, with up to hundreds of nodes," explains general manager of advanced rendering solutions at Nvidia, Phillip Miller. "But you only get the benefit of the cluster when you stop moving, because only then can you load balance across all of those nodes. When you're actually interacting, it's very hard to get more than a couple machines worth out of a 100 machine cluster. It's the interactive experience that's so special with a GPU renderer that you cannot get with a CPU renderer."

Despite the potential advantages, however, the use of the GPU also involved some fairly critical limitations for the CG world. Final frame rendering on the GPU would mean having to deal with a feature set limitation when it came to rendering all of the shading and lighting needed to achieve an excellent quality result. Most critically, however, there was the limited memory size of GPUs – something impossible to deal with considering the often massive sizes of the 3D scenes used in professional production. The Quadro K6000, however, changed everything. It had 12GBs of GDDR5 memory per GPU, which doubles the amount of RAM that had been previously available. Along with help from memory-saving techniques such as texture compression, rendering a beautiful interactive final production shot with completely noiseless, smooth global illumination all on the GPU was now possible.

For the team at Chaos Group, taking a look at the new graphics card, an opportunity to push just what could be achieved with the new technology came from an idea by Kevin Margo, CG and VFX supervisor at the award-winning production company right next door: Blur Studio.

CONSTRUCT

"Right at about the same point we were looking at the K6000, Kevin was like 'I want to make a short movie, I've been thinking of this idea' and we said 'Let's connect the dots'," Grohs remembers. "We started to work with Kevin and Nvidia and it turned into a project. At first it was to test final frame rendering on the GPU."

"On the technical level many large studios have had the assumption for years that CPU rendering was the way to go," Margo explains. "There's this sort of model of we're going to have an internal render farm and it's going to sit in this giant server with all this air conditioning and everything. As my role as a CG and VFX supervisor, I guess I'm a curious guy. I wonder if things could be done in a different way. GPU rendering is just kind of an extension of that. Here is the potential to be able to get much faster performance and render time."

"GUYS LIKE KEVIN COULD RENDER SOMETHING THAT'S THREE TIMES TOY STORY OUT OF THEIR LIVING ROOM! IT OPENS UP A WORLD OF POTENTIAL"
LON GROHS

Excited about the idea of getting interactive ray tracing in real-time with V-Ray beside the team at Chaos Group, Margo wrote out the two-page story for a new short sci-fi film, *Construct*, taking care to keep the scene size and asset cap limitations in mind. "Nvidia had guys to show that it's possible to render final frames on the GPU, so I went off and I thought about it," he explains. "I did benchmark tests and everything and it seemed like yeah, that's reasonable were I to operate under the constraints. I could actually do it."

With the planning in place, Margo began work on *Construct* using V-Ray 3.0 RT GPU, 3ds Max 2014 and machines that had been donated to him by Chaos Group's partners, with the equivalent of three graphics cards in total. With just one Quadro K6000 shortening the render time for an HD frame from more than three-and-a-half hours on two Intel CPUs down to just 34 minutes; three graphics cards pushed the time even lower: to 12 minutes and 42 seconds.

That's when Nvidia came out with the VCA. "Suddenly instead of having just access to three cards, you could have access to eight cards in one machine!" laughs Grohs. "When we plugged it in for the first time we plugged all four plugs in at the same power strip and blew the fuse – we learned our lesson there."

Soon, things became even crazier: the team was given access to Nvidia's cluster in Santa Clara. It was essentially a room full of VCA boxes accessible over the cloud, allowing the team to use the cluster like a render farm where each VCA would render a frame. At one point, this meant Kevin had access to up to 15 $50,000 VCAs' worth of power – this is the equivalent of over a hundred CPU servers, and all without the need of a massive farm or any IT infrastructure either. "HD frames were taking three minutes and all ray traced, with beautiful GI and all of the camera's motion blur and depth of field rendered in-camera," Grohs remembers.

"It was amazing! It was absolutely beautiful. It changed the way I work and not only because the VCA's amazingly fast, but it was the first time I'd really used the concept of cloud rendering," Margo tells us. "I'm sending data to be rendered and just downloading the returned final frames."

Once rendering on the VCA cluster was running quickly and successfully, the team pushed

The making of *Construct*. Kevin Margo and the team at Chaos Group are currently exploring further innovations in real-time ray tracing using the VCA

Q&A WITH LON GROHS

How has the first year of experimenting new technologies at Chaos Group Labs been?
It's been pretty exciting. On 1 January we celebrated our one-year anniversary. It was always something that I had in the back of my mind when I moved to Los Angeles from Boston and I was living here just working out of my house for Chaos Group for a while and then we sort of brainstormed what we were going to do when we opened up an office. In our first year of having Labs live, we've already surpassed any expectations of experiments that I thought we were going to get through successfully. We also now have the Labs website up at **labs.chaosgroup.com.**

What makes you most excited about the introduction of the Nvidia VCA?
When I was in production I spent a lot of my life waiting for things to render. We were testing some scenes early on in the cluster where we were putting together several VCA boxes and rendering didn't exist! You didn't actually even see it render – it just gave you a final frame back and that to me was pretty amazing. We can now retire the word!

Do you think rendering fully on the GPU is the way the industry is going to go in the future as opposed to the CPU?
It's interesting because in my perspective I see merits to both. GPU is definitely moving forward and it still has some limitations to it. There's still the RAM limitation and then there's also a bit of a feature set limitation though that is going away. We are also working on some things that allow you to do what we call 'massively parallel rendering' on the CPU. If you look at some of the cloud rendering providers, over 90 per cent of the machines that they have are CPU, and the last five are GPU and that will probably change over time. But it's going to take a little while before there's a major move for those data centres from CPU to GPU, so we want to be able to leverage that CPU compute model as well. We're doing some things that allow us to take advantage of just about any computer that you can put in a sequence to render.

So far the CPU and the GPU have become the two main methods that have survived the test of time, but if tomorrow there's a new piece of hardware that blows everything out of the water, we'll try to be one of the first to give that a try and get that up and running!

RENDER-TIME BREAKDOWN Rendering a single frame of *Construct* at very high quality (HD, 24 frames per second)
2 x Intel E5-2687W at 3.1GHz (32 threads)
3 HRS 31 MINS 21 SECS
1 x Quadro K6000 GPU
34 MINS 15 SECS
1 x Quadro K6000 GPU + 2 x Tesla K40 GPUs
12 MINS 42 SECS
Distributed rendering to the VCA (8 x K6000)
5 MINS 4 SECS*

Construct and the VCA even further than before. They met up with *2001: A Space Odyssey* effects legend Douglas Trumbull and were introduced to his immersive MAGI format – featuring full 4K resolution at 120 frames per second and all in stereo. "So not only were we working on 120 frames per second, but we went from 2K (which is standard HD) to 4K and, to make matters worse, it's stereo, so twice that!" reveals Grohs. "120 frames a second with 4K in stereo is actually 40 times the standard amount of rendering, which makes an eight minute short the equivalent of rendering *Toy Story 1* through to *Toy Story 3*!"

With the one-minute teaser for *Construct* rendered in full MAGI format in just a few weeks, the VCA cluster certainly seems up to the task. "I want more people to experience the feeling I had when I saw it essentially not render. It's real-time without any tricks or hacks; not like it's part OpenGL and part ray tracing – no, it was the full thing," Grohs continues. "Having that kind of toolset and capability for artists is just good for society! The faster that it is, the better our designs can become, the better our entertainment can become. Guys like Kevin could render something that's three times *Toy Story* out of their living room! It opens up a world of potential."

CONSTRUCT IN NUMBERS
(per scene)

225
Average number of textures

50
Average number of shaders

5 GB
Average video memory used per scene

3000
Average number of objects

2.000.000
Average face count

* Only the VCA was rendering; the local machine was not included in the distribution

The future of rendering

Though rendering is not the only bottleneck in the pipeline, the Nvidia VCA has helped get *Construct*'s one minute teaser in MAGI completed in just a few weeks – an eighth less time than if it were rendered with other hardware configurations

"WORKING ON THE CLUSTER, IT WAS LIKE FOR THE FIRST TIME I COULDN'T KEEP UP WITH PROVIDING STUFF FOR THE FARM. THAT'S A COMPLETELY NEW SCENARIO FOR ME"

KEVIN MARGO

RENDERING FOR THE FUTURE

Of course, despite the wonders of rendering a short, photoreal CG film fully on the GPU and successfully creating its teaser in MAGI format – using the VCA did not come without its difficulties. After all, though 12GBs of memory is a major breakthrough for a GPU, at Blur the CPU render farm normally deals with around 48GBs per host of RAM on a regular basis. To create *Construct*, Margo needed to make sure that everything could fit within the limit, using the same robot models and two-by-four houses on the construction site, along with geometry instancing concepts for any of the repeatable elements, like the bushes for example. This would make the system unfeasible on its own for many studios today.

If these past few years are anything to go by, though, memory on the GPU is getting larger by the minute – making it only a matter of time before this problem could be finally resolved by companies like Nvidia. "Either the memory gets larger on the GPUs or we come up with ways of pooling across," Miller confirms. As for the limited feature set with a GPU that had been a problem in the past, Chaos Group's latest service pack for V-Ray RT GPU alone now supports hair and skin rendering as well as light cache for tough architectural interiors.

Even the hefty price of $50,000 is something Nvidia is aiming to tackle. The company is considering the introduction of services like a rental option to their VCA cluster for smaller studios and artists. Theyare already working on promising new collaborations with the likes of MPC and Pixar – one of the first customers for the VCA. Meanwhile, Margo and the team at Chaos Group are also continuing to experiment with all kinds of other future possibilities as they continue work on *Construct*, the full eight-minute 2K version of which is being aimed for release at GTC. The ability to take ray tracing into motion capture, allowing the actors to be ray traced in real-time as their robot characters, for instance, is something the team has begun to explore.

"Kevin felt like this would be a new paradigm in film-making, to take the same assets that you were going to use throughout production and use them at the beginning all the way through the film-making process," reveals Grohs. "Our developers took V-Ray and made a prototype of it running inside Autodesk MotionBuilder, and there were all kinds of challenges there – with final frame rendering you set it up and you kind of let it run until it's done, but in the motion capture side of things we were trying to ray trace the scene in 1/30th of a second. That's been an ongoing experiment!"

"There's still so much I want to try out on the motion capture realm. I have virtual reality and augmented reality ideas, or more with MAGI rendering," continues Margo. "I'm really excited about VR and AR stuff. What GPUs, VCA and V-Ray RT are showing is that you can start to render things in real-time with photorealistic and physically based rendering techniques, and I think this is just the tip of the iceberg in terms of where this could go.

"Think augmented reality. If you could render with the same lighting conditions as the scene in front of you, what you put in the world in front of you can look convincingly real. Stuff like that is super exciting!"

No matter if the most promising future for GPU rendering and the VCA is in motion capture or realistic lighting previews, one thing is certain: it can change the rendering for good. "Working on the cluster, it was like, for the first time, I couldn't keep up with providing stuff for the farm," Margo concludes. "That's a complete new scenario for me. Usually I'm the fast one and waiting on a render farm to give me results." With the VCAs and GPUs, rendering doesn't have to be overlooked at the cinema. It has the potential to be so fast it's forgotten about altogether.

THE VCA ANATOMY

- Fitted with eight high-end Quadro K6000 GPUs
- Each K6000 features 12GB of GDDR5 memory, doubling the amount of RAM that had been previously available
- Includes a total of 23,040 CUDA cores
- Xeon E5 (2.8GHz) CPU with 20 physical CPU cores, and 40 CPU cores with Hyper-Threading
- System memory of 256GB with a 2TB SSD Storage
- Includes both the 10GbE (SFP+) and InfiniBand network connections too
- Installed software includes Linux CentOS 6.5, Nvidia's VCA Manager, and Nvidia's photorealistic rendering solution, Iray, version 2014.3.4 and up
- Chaos Group's V-Ray RT takes advantage of the parallel processing capabilities of the VCA, bringing GPU rendering to V-Ray for 3ds Max, Maya, Rhino and SketchUp
- Users can combine multiple VCAs to improve their project's interactive quality until the experience is like walking around a physical model as you manipulate it in a scene
- Nvidia's VCA Cluster is a room full of VCAs available over the cloud – potentially eliminating the future need for a traditional render farm
- Each VCA is priced at £32,000, but Nvidia is considering introducing a rental option for its VCA Cluster in the near future
- Nvidia is now working with companies like Chaos Group and Pixar to develop the capabilities of the VCA even further for rendering and VFX

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Model by Steve Talkowski
sketchbot.tv

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Technique focus

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LIGHTING For the lighting I used Blender and Cycles render to create this image. I mainly used mesh lights as it has more light-direction control. I set up my lighting and rendered a low-resolution image, with all the objects in the scene using a diffuse shader. I made lighting adjustments accordingly and rerendered with the proper materials. **Caterpillar on flowers,** 2014

Konrad Adamski

Website the-epic-k.deviantart.com
Country Canada
Software used Blender, Cycles
Bio As a student of film arts with a passion for visual arts, Konrad has been using Blender as his primary art tool for the last four years

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Create a zen garden

Step by step

Easy-to-follow guides take you from concept to the final render

Sérgio Merêces

3DArtistonline

Username: smereces

Personal portfolio site www.sergiomereces.com

Country Portugal

Software used 3ds Max, V-Ray, Photoshop

Expertise Sérgio specialises in lighting, rendering and post-production

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Learn how to

- ☑ Model
- ☑ Use lighting and materials
- ☑ Utilise the Forest Pack plugin
- ☑ Render with V-Ray
- ☑ Work in post-production

Concept

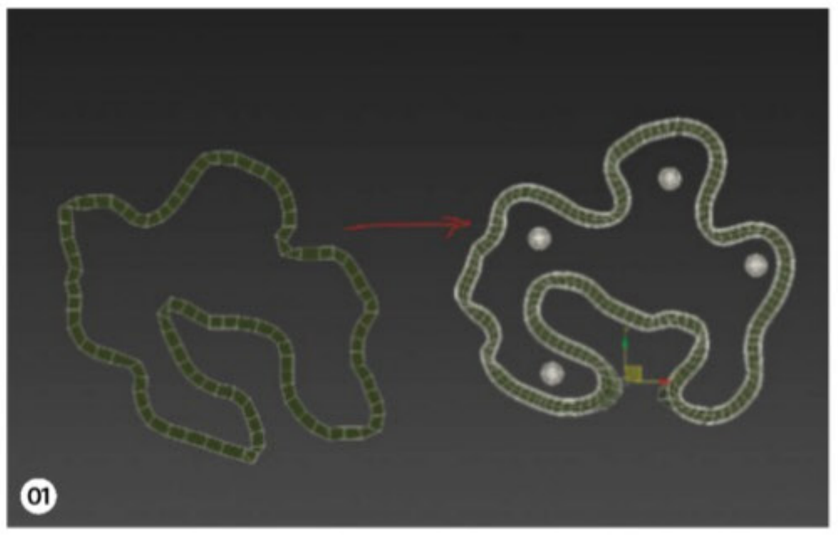
I begin all my projects by searching for good references that I can use for modelling the assets or for inspiration. For this I use sites like Google Images and Flickr.

Zen Garden 2015

> Learn how to create a 3D zen garden with 3ds Max tools, a V-Ray render engine and then do the postproduction in Photoshop

Sérgio Merêces is a 3D artist specialising in arch-vis. He founded and owns 3D Visualisations studio Merêces Arch & Design 3D Visualizations, where he works with clients around the world

In this tutorial, we will cover all the important steps in the creation of a 3D image. We will begin by searching for the best references and looking for the right parts to base a scene assets' modelling on it. Then we will show you some modelling processes for the scene, the assets and how to create the textures and materials. We will also cover the whole light setup with an HDRI map and find out how to use V-Ray RT with it. Then we will create and spread vegetation in the scene by utilising the Forest Pack. Finally we will finish with postproduction in a raw render to get the final look for the image, using adjustments in Photoshop (Curves, Levels and Gamma) and some plugins.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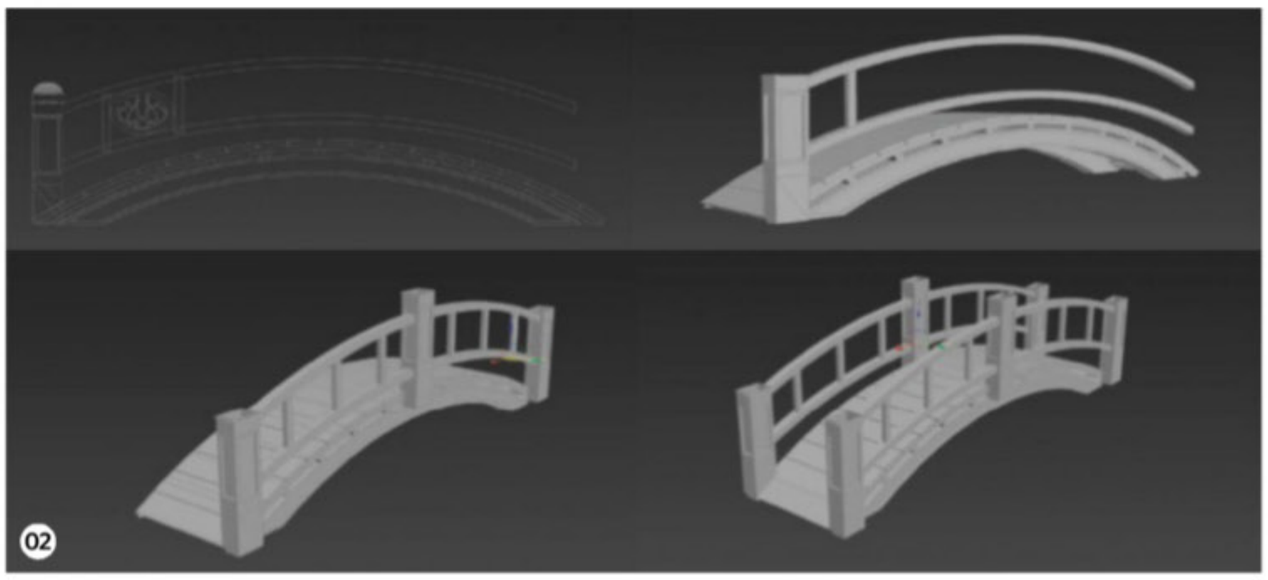
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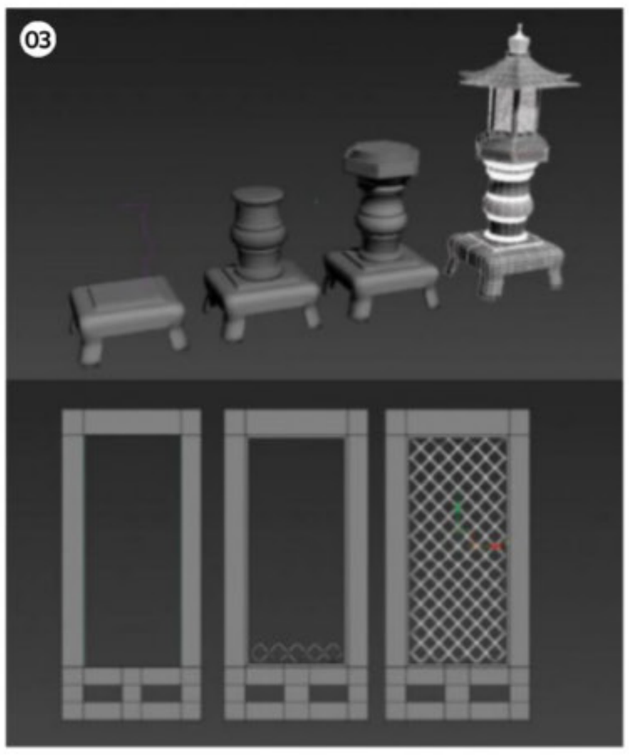
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04

01 Model and design the terrain

To create a beautiful and peaceful secret zen garden design, we will need to design and model the terrain. Create the grass parts that will delineate the base of the garden with the editable poly. Utilise the Strips tool and then draw the desired look in freehand. Select all the faces and extrude them to get the elevation and apply some bevel to the edges to give them all a smooth finish. Then we will move on to creating the part of the terrain that will be filled with the little rocks and pebbles that can be found in zen gardens. To do this, make a normal plane in the middle of the grass part. In Edit, with the edge selected, extrude and adjust the terrain to fit with the grass parts.

02 Create the bridge

The fastest way to model the bridge is to use splines to draw the entire sketch. When you get the desired design, select each part of the bridge separately, and extrude and convert them into an editable poly. After you get all the bridge parts modelled, copy and position all the repeated parts and set them in place. Finally, copy all of the side parts of the bridge to the other side so that it is symmetrical and looks exactly the same on both sides.

03 Make the stone lamp

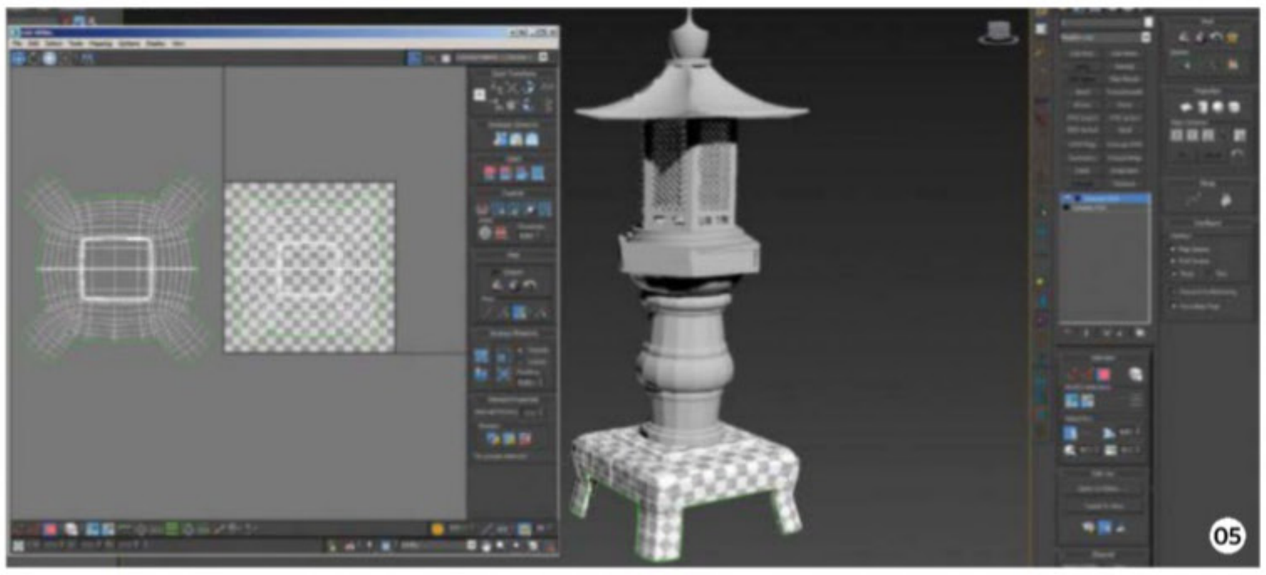
To make these lamps, model the base with the box as a primitive, then change it into an editable poly, extruding the faces. Then model the middle part of the lamp drawing a spline to get the desired shape and apply the Lathe modifier. Next, using a box with editable poly, model the next part and extrude some details. To model the fire inside of the stone lamps, model the grids using the great script from Itoo called Clone – this script is brilliant for cloning objects and creating cool patterns.

04 Illuminate with HDRI

For this scene we have used a single V-Ray Dome Light with an HDRI map applied. The HDRI map that we have chosen to use was a free texture made by the guys over at NoEmotion (**noemotion.net**). The scene was created with the help of a simple VRay Dome Light with the HDRI added into it. Then we go on to launching the V-Ray RT, and in real time, adjust all the parameters in the V-Ray Physical Camera and HDRI map to achieve the desired look in the entire light scene.

Light and texturing

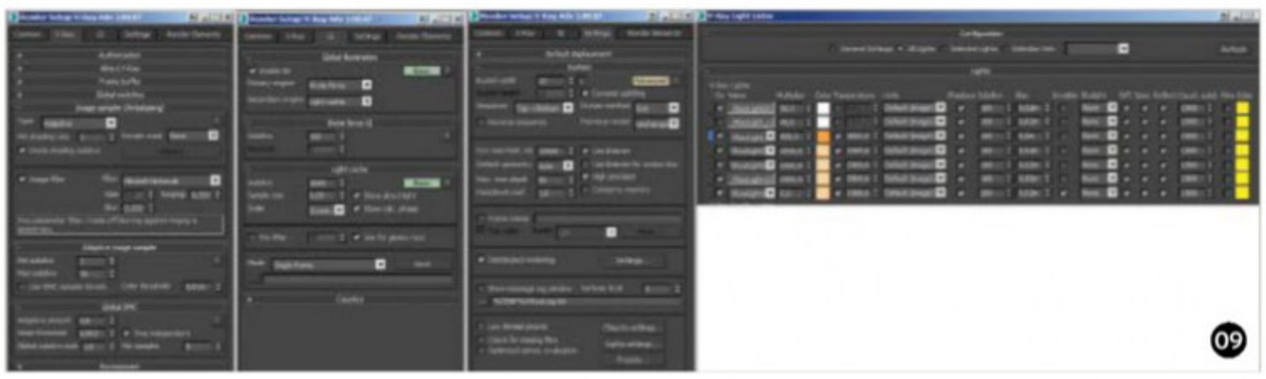
If you want to texture the object details, you can do complete Unwrap UVW mapping. This will enable you to paint light on all the desired details in the textures of the scene objects and even on other things in a unique texture map! 3ds Max has great Unwrap UVW tools that will let you unwrap a object quickly and easy. The Pelt Map tool works really well in most cases to unwrap your objects, and you just need to tweak a little bit to archive the final mapping result.



05 Unwrap the UVWs After the scene light has been set up, advance with the UVW mapping, texturing and materials creation. We have done all of the UVW mapping in the scene and you can use Unwrap UVW to do the mapping in a specified object. Separate the object into parts, and select the base of the stone lamp and apply the Unwrap UVW modified. Next, choose the Point-to-Point Seams tool and select the edges that will separate the object into two parts. Apply the Pelt Map tool to get a fast and clean Unwrap UVW. For the other parts, use the same system to get all of the UVWs set up.

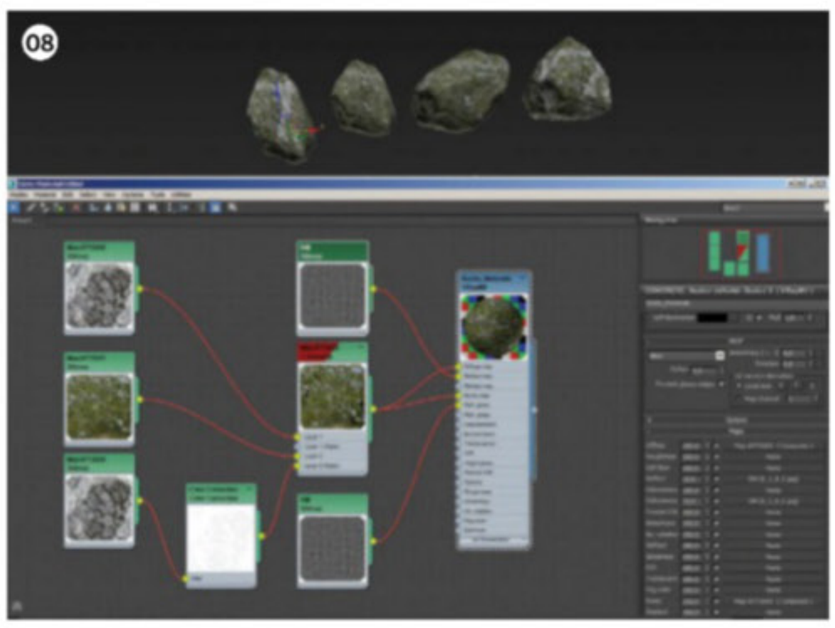
07 Texture in a single map Now that we have all the scene objects, with a unique UVW created with the Unwrap tool, we can texture all of the details in a single texture map. BodyPaint from MAXON can be used to paint the 3D object directly – it has effects that we can use that are similar to Photoshop ones like Paint and Apply. Export the object to a separate FBX file and import it into BodyPaint, but first set the material texture size and channels. For size, use 1024 by 1024 for small obejcts and 4048 by 4048 for ground or hedge objects, so that you can get greater details on a larger scale. For the material channels, use Color, Reflection, Bump and Specular. Create a new layer and paint over the 3D model using two textures: one for the stone base and the other for the moss effect to be painted in areas with a new layer.

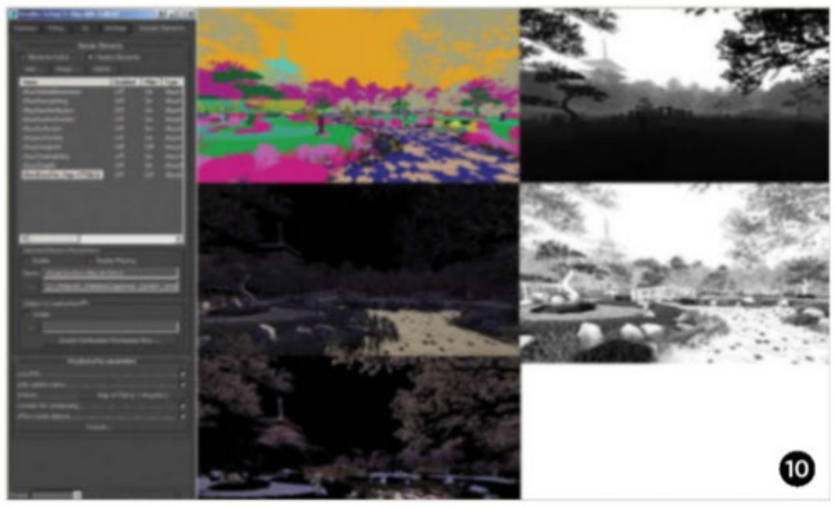
08 Make the materials For the Scene Materials, use the base VrayMtl material. In this example we'll be creating the rock's material by setting a composition shader into the difuse channel. With this composition shader, mix multiple textures types with custom alpha maps. Choose two textures again, one for the stone base and one for moss. Then, set up an alpha channel to mix both using a noise shader. This creates procedural textures quickly.



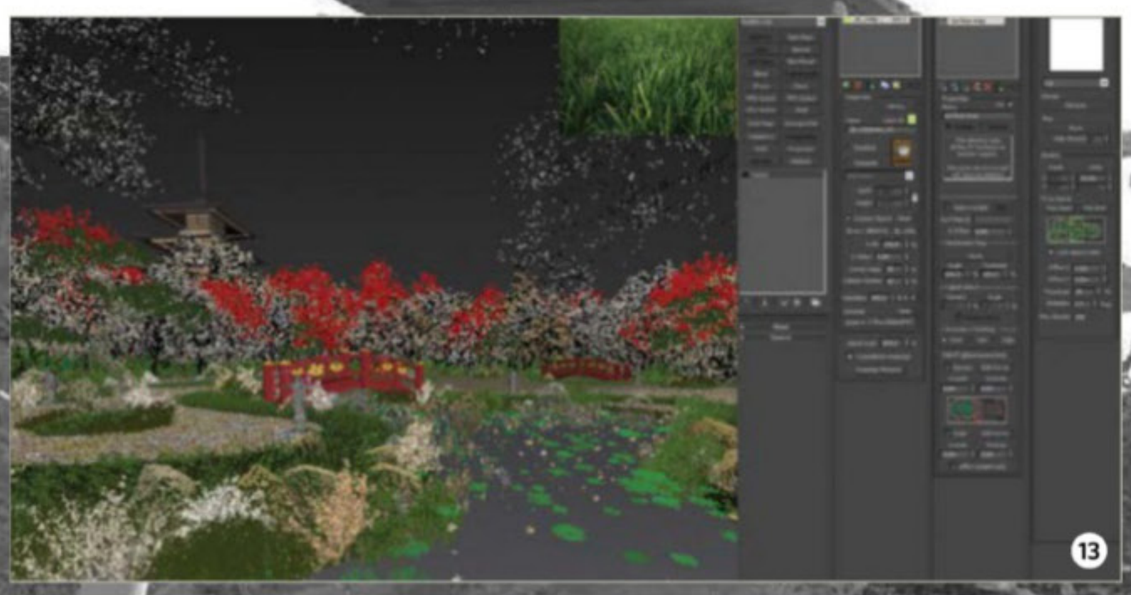
09 Change the render settings This is where we will set up our output image quality for our 3D renders. We will render the images with an output of 4000 pixels minimum with 300dpi. For the V-Ray settings, create two presets: one for quick renders that can also get good results and the other one for projects that you will actually have the time to render. Of course, this will give you much better results in the end, but sometimes when we have extremely tight deadlines we need to have another option. For this project, use the best option because you will have the time to work on the render and you can check the settings in the image.

06 Search for textures to use in the project At this stage we will discuss some essential resources that enable you to search for amazing textures. For example we have a few great websites that have free texture resources available such as **cgtextures.com**, **extremetextures.com**, **texturelib.com**, **freestocktextures.com** and **openfootage.net**. If you don't find the desired texture you want, there are always websites that sell textures too, such as **cg-source.com**, **arroway-textures.com** and **vizpark.com**. Remember, getting the best results with the materials in the render is really important as you will then have high-quality textures to use in your projects.





10 Use render passes Here is where you will set up all the output render passes needed later for the post-production process. There are four passes that are indispensable for managing all post-production in Photoshop or After Effects. The VrayRenderID is a pass that masks the entire scene and where we quickly select the parts in the image to mask it. Then you have the VrayExtraTex where you will set up your AO pass for the scene and finally the VrayRawlight and VrayReflection. These are the most important passes, but in some cases we may also need VrayZedepth, for example.



11 Plant a cherry tree with SpeedTree To model a particular vegetation species for use in this project, SpeedTree offers us a great set of tools to model vegetation quickly and precisely. Create a base trunk, then add other layer of trunks to give some variation for the main spine of the tree. Add two more layers for the small branches – these will be filled with the cherry tree flowers. To get different variations of the tree, SpeedTree has a random button that will automatically generate different results based on the settings we opt for.

12 Collect the different types of vegetation For all of the vegetation used in the zen garden, we used packs from existing 3D models such as VIZPARK vegetation models, Forest Pack grass presets, one type of Evermotion tree and of course the 3D models that we created in this tutorial. For some models, improvements on the materials were needed to get the best results for the final render.

13 Spread with Forest Pack To spread and create all of the vegetation and rock ecosystems, use the Forest Pack plugin for 3ds Max. This is a great plugin for managing huge amount of models and can perform really well with a scene like this! It's quite easy to get really good results with the Forest Pack plugin. One example is that we used the presets that came with the Forest Pack plugin to make the grass and the little sand rocks of the zen garden.

Post-production tools and plugins

We can find great plugins that will let us improve our images in the post-production process in Photoshop or After Effects. In our pipeline, we used ones like the Magic Bullet PhotoLooks, Nik Collection and Red Giant Knoll Light Factory. These tools work with the Photoshop adjustment layer to power our post-production to the next level.

Artist showcase

Sérgio Merêces

I'm from Portugal and I live in a beautiful city called Évora. I have been working on 3D visualisations for the past ten years, and worked on national and international projects for both architectural and nonarchitectural practices too. Over the years I have focused my skills on the creation of beautiful and unique images for architecture.

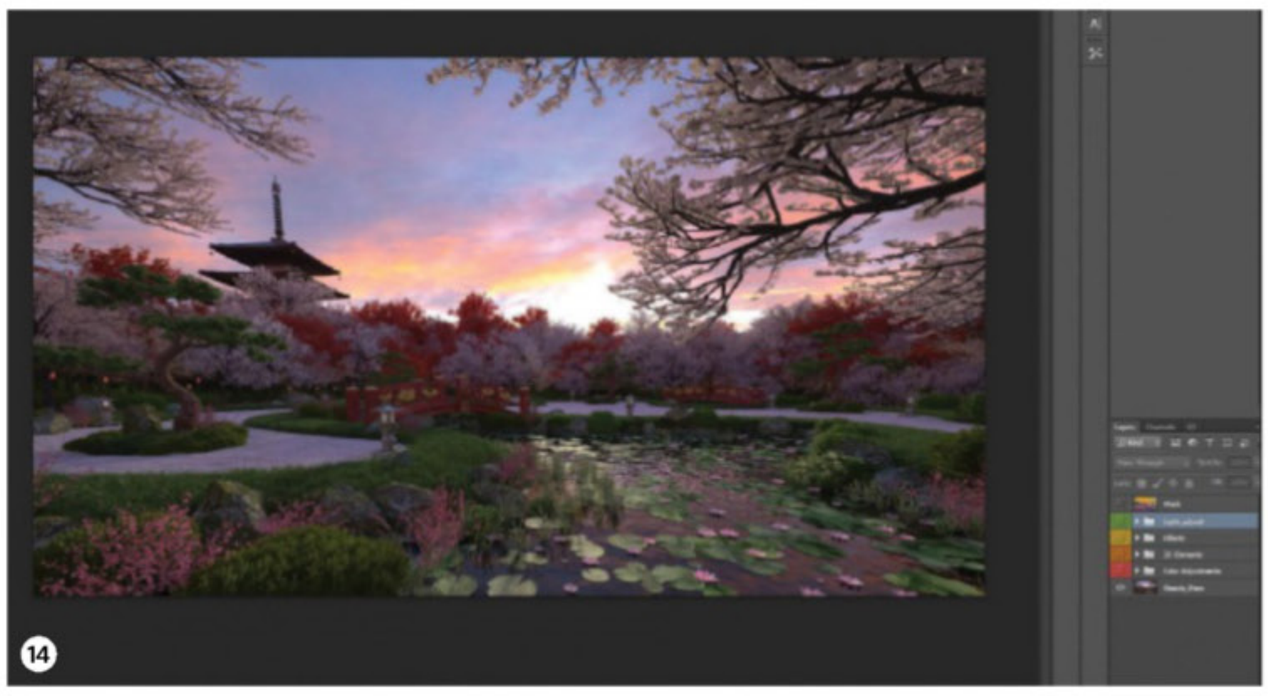
Seattle Lounge **3ds Max, V-Ray (2013)**
This was a personal interior 3D Render I did for a space redesign in Seattle. I used 3ds Max for the 3D and render and then I did the post-production in Photoshop.

Unesco Offices **3ds Max, V-Ray (2014)**
The above image was a project for the client Domaine Public Architects. This 3D visualisation was a project for the new UNESCO building.

KRC Congo **3ds Max, V-Ray, Photoshop (2014)**
A project for the client Keldi Architects for a new city based in Congo. Again, 3ds Max was used for the 3D and render, and the postproduction process was done in Photoshop.

14 Import and set up your render passes Before we work on the post-production, it is really important that we organise and import all the render passes in the PSD. Photoshop has the folders and colours to help us in the organisation of the project. First, open the beauty pass image and then with File>Place, bring all the render passes into the PSD. Now create the folder where you will put the layers while you're working on them so that you can stay organised.

15 Fix some minor errors Sometimes after the render finishes, we look at the rendered image and find errors that we couldn't figure out before because they are only visible in the final render resolution! The solution is to do a render region in the zone that contains the errors and after they are rendered, bring them into Photoshop and compose them in the raw render image before you begin post-production.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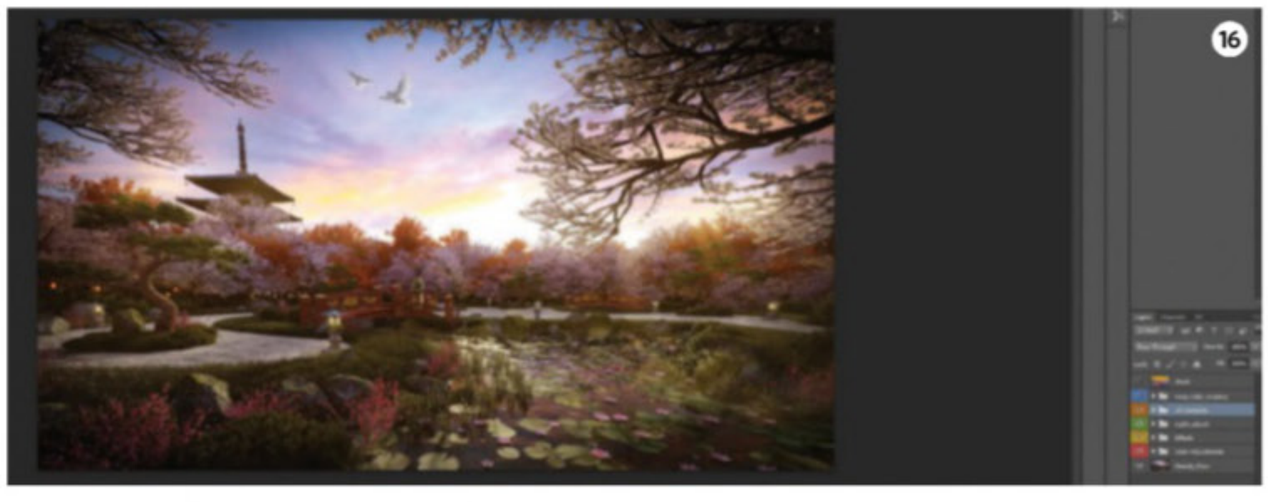
15

Apply 2D elements

You can apply a few 2D elements to get a better composition in the 3D image. The 2D elements that are used for people and animals in the zen garden image we have created for this issue are the women and the two flying doves. These 2D elements have come from free resources, and you'll need to be sure about the 2D elements that you'll use regardless of if they're free or not.

16 Apply the initial adjustments Now we will complete the post-production steps to achieve the desired look for the image. Apply some basic colour corrections to give more balance to the image by utilising the Layers, Curves and Levels in Adjustments. Then apply some basic effects such as the fog and sunlight with the help of the VrayZDepth pass, where we use the VrayZDepth in the channels as alpha. Select that layer to give a selection based on the depth of the VrayZDepth pass and then create a new layer and paint it with a normal brush. Set the opacity to 50 per cent for the fog to create some atmosphere for the scene.

17 Final colour grading This is the most important step in the tutorial, because it will be here that we get the image to the next level! After all the previous steps have been done, we can now work with the final colour grading for the image. Use the adjustment layers first (Curves, Color Adjustment and Selective Color), and then flatten the image to bring it into the Magic Bullet PhotoLooks. From there we will apply the final adjustments. Check the video file available on FileSilo to watch the post-production process!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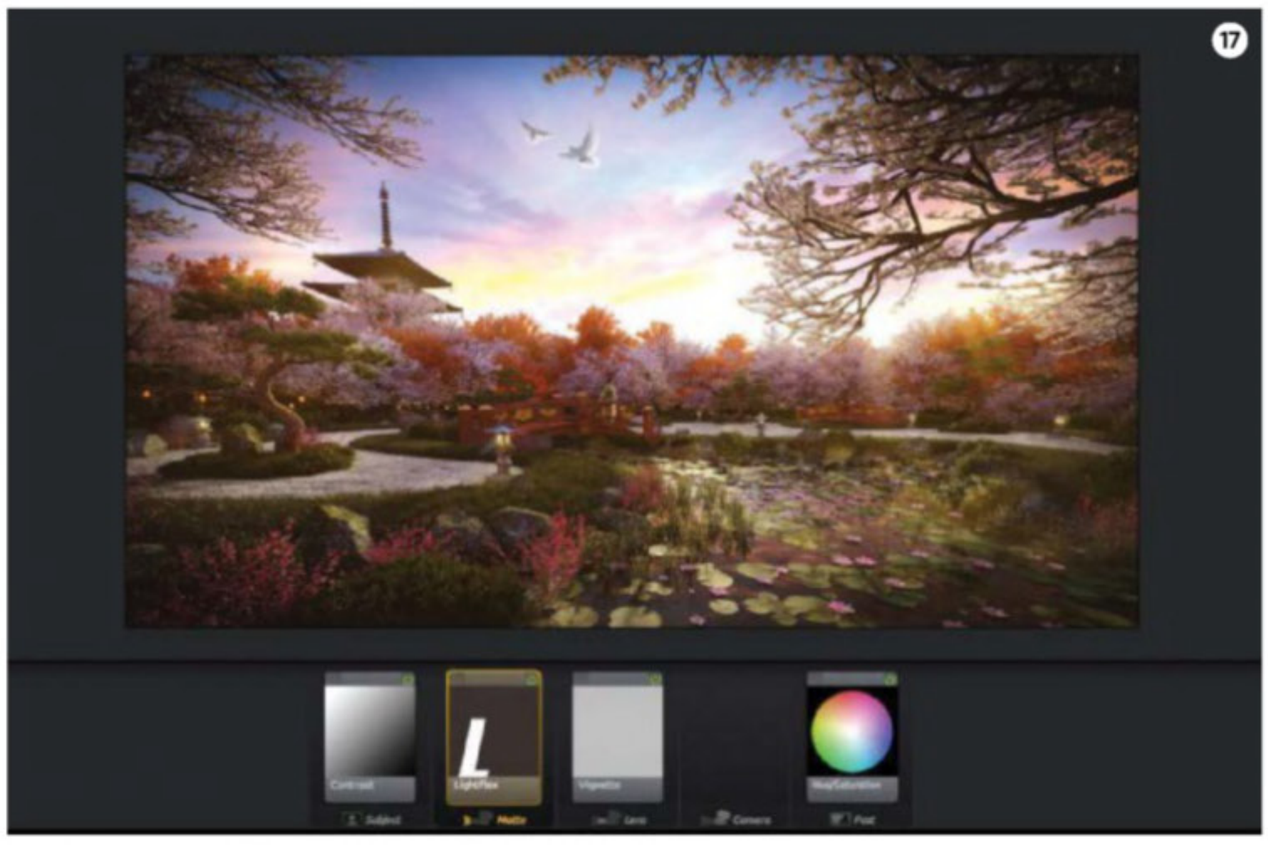
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Technique focus

Incredible 3D artists take us behind their artwork

LIGHTING One of the most important parts of visualisation is combining a good light with a realistic shader. Many architectural photos could improve your viewpoint and let you learn more about natural light. In this scene I used a dome light with texture as a main light to achieve a warm light, and used VRay IES and VRay Sphere as the halogen and stand light for the interior. **Minimal Villa,** 2014

Mohsen Hashemi

3DArtistonline

Username: Mohsen Hashemi

Website
www.psdesign-co.com

Country Iran

Software used 3ds Max, V-Ray, Photoshop, Red Giant PhotoLook

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Use MODO deformers to enhance cartoon characters

blu-E 2015

> MODO is an amazing tool for character exploration work, and its deformers enable quick manipulation for this purpose

Warner McGee has been a freelance Illustrator and character designer for over 20 years. Character creation is his passion

It's frustrating to create a well-modelled and textured character only to be limited by the rigging of the character. In this tutorial we'll remedy this problem by bringing a character to life using MODO's deformers. We'll use deformers to enhance the character's expression and bring his personality to the surface. We'll get started on the next page!

Step by step

Easy-to-follow guides take you from concept to the final render

Artist info

Warner McGee

3DArtistOnline

Username: Warner McGee

Personal portfolio site
www.warnermcgee.com

Country USA

Software used MODO 801

Expertise Warner specialises in making characters for games, toys, animation and print

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Tutorial files:

- Tutorial screenshots

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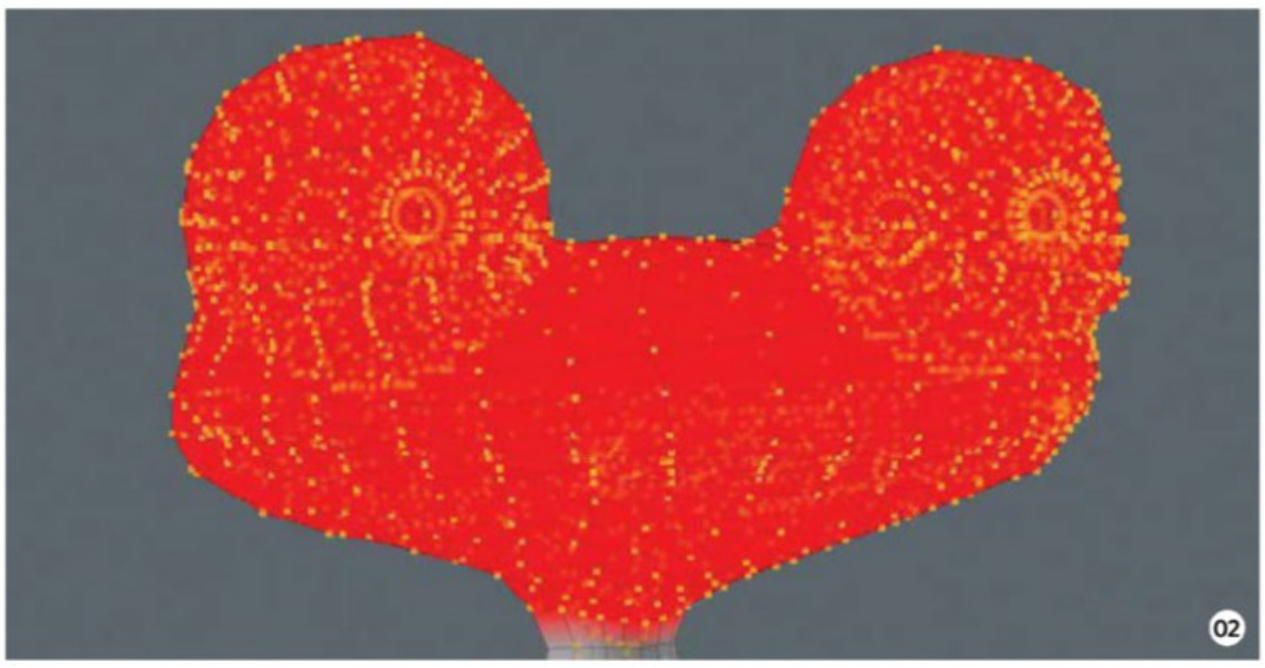
Learn how to

- ☑ Use MODO's deformers including Lattice and Transform Effectors
- ☑ Utilise MODO's Actors and Poses tools to store nondestructive poses
- ☑ Master the use of MODO's Order of Operations deformation stack
- ☑ Adopt Normalization in the deformation stack
- ☑ Pose a character workflow
- ☑ Create Custom Locators for Animation controllers
- ☑ Use Dynamic Parenting
- ☑ Adjust weight maps and painting weights
- ☑ Create Weight Containers

01 Start the project As with any project, it's always a good idea to have a goal in mind for the best results. Sketching is a quick and effective method for putting down your ideas. As you're planning out the project, consider what you want the character to do and how he would move. What emotions, gestures or poses do you want him to hit? Answering these questions will not only give you a road map of where you're going but will also give you an idea of where to start. MODO offers many fun deformations that we could use, but for this tutorial we'll use just two of them: the Lattice and Transform Effectors.

02 Select vertices for the Lattice Deformer Identify and select the vertices within the different geometry layers that we want to assign to the Lattice Deformer. In our case this will be the head section: frog body, left eye and right eye geo layers. In the Setup Tab go to Deformers (side panel), and with the vertices selected, create a Weight Container (WC) and label it 'Head_WC'. This WC will define which vertices will be controlled by the Lattice. You can think of a Weight Container as a container Item that you can add to or delete points from.



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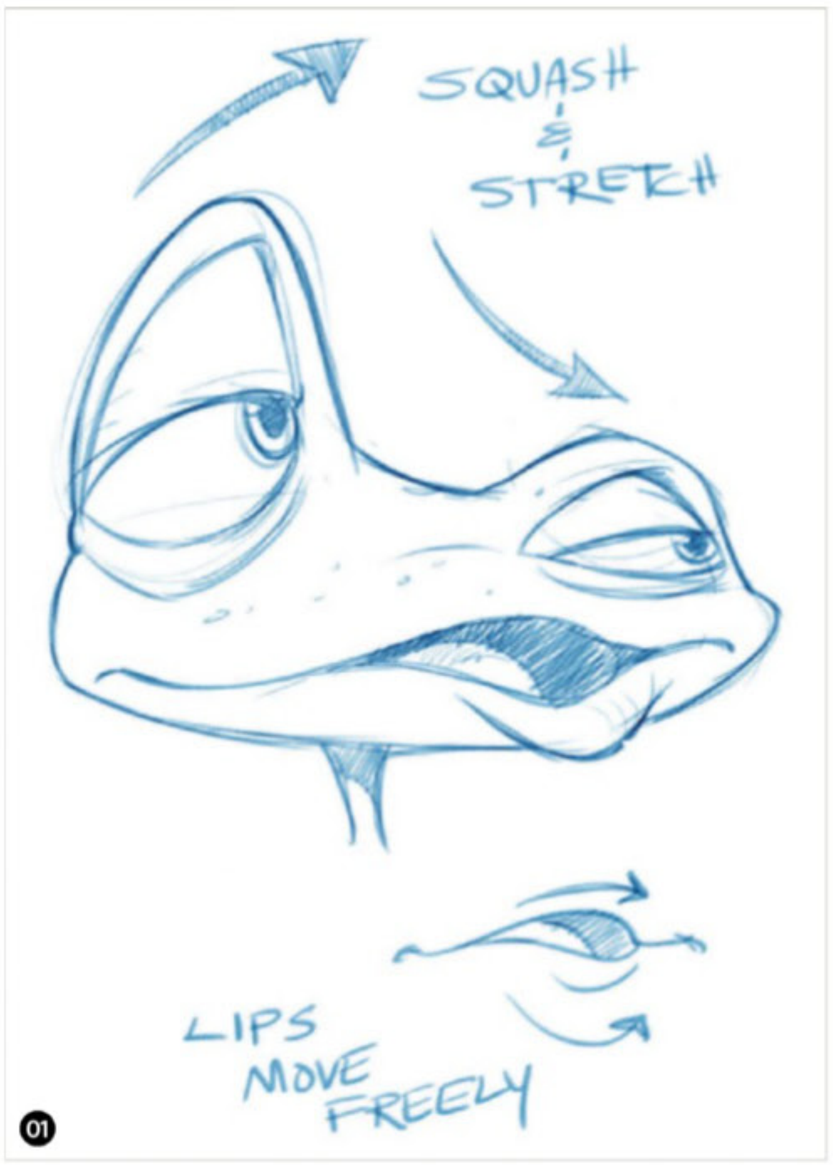
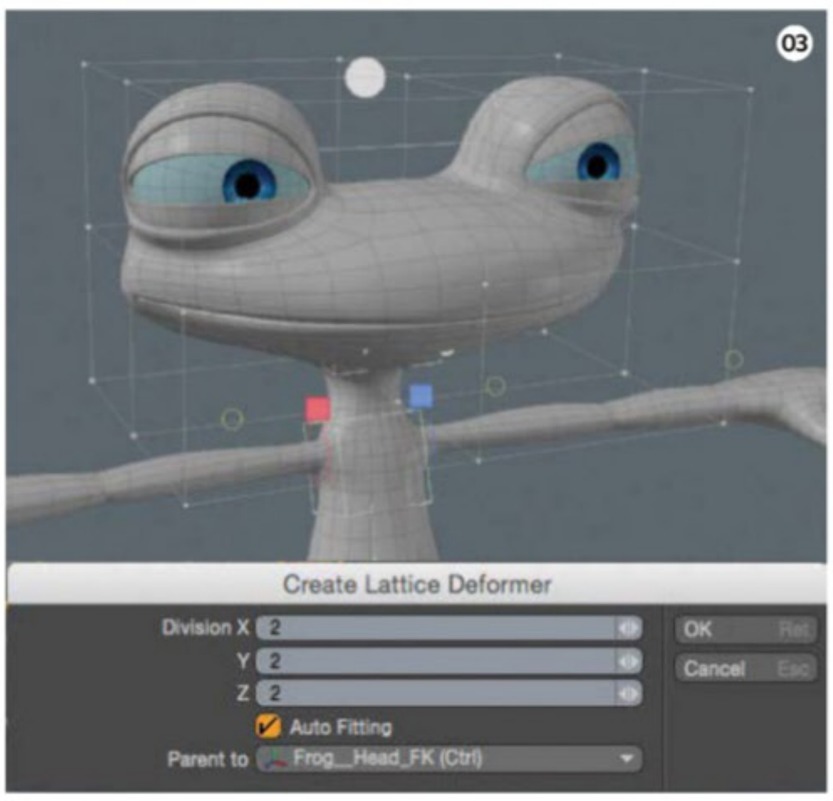


01

Alternate Deformers can be used

Alternatively you can get similar deformation results by using Radial Falloff deformers or even Magnetic Effectors on the mesh. In Item mode simply select the mesh(es) you want to deform and choose one of these deformers. Enter Setup mode to position and resize the deformers as you'd like, exit Setup mode and move them around to see your results. Take some time to explore these deformers and see how you might use them with a character.

03 Create the Lattice Deformer Select the Lattice from the Apply Mesh Deformer side tab to assign the Lattice Deformer to the vertices. Choose two divisions for the X, Y and Z axis, autofit and select the head bone for the parent. You can of course have more or fewer divisions depending on the amount of deformation you require. The reason we Parent the Lattice to the head bone is to ensure that the Lattice will follow the head bone should we move or twist the head in posing. If you're not working with a rigged character, or don't have the need to Parent the Lattice, select none.



03

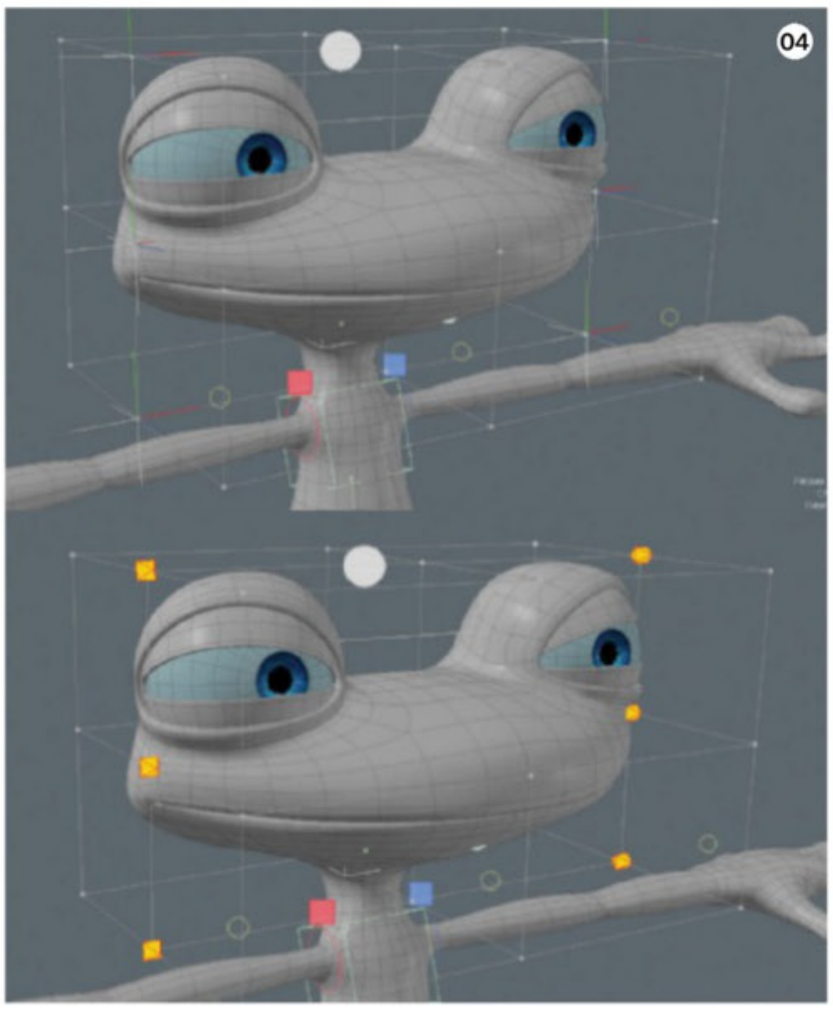
Artist Showcase

Warner McGee

I am fortunate as a freelance artist to love what I do for a living. My home-based studio is in the small, southern US town of Savannah, GA, where I work and live with the love of my life and our two fine boys. I hope I never wake up from my dream job. I love to draw characters but have found that only 3D tools enable me to get the final art looks I need to evolve as a character artist.

Tutorial Girl
MODO (2014)
From my tutorial series entitled 'Creating a Character with Warner McGee'.

Jippi - Cool Kids - Rudi
MODO (2014)
A collaborative character project with my dear friend and fellow MODO artist Tim Cooper.



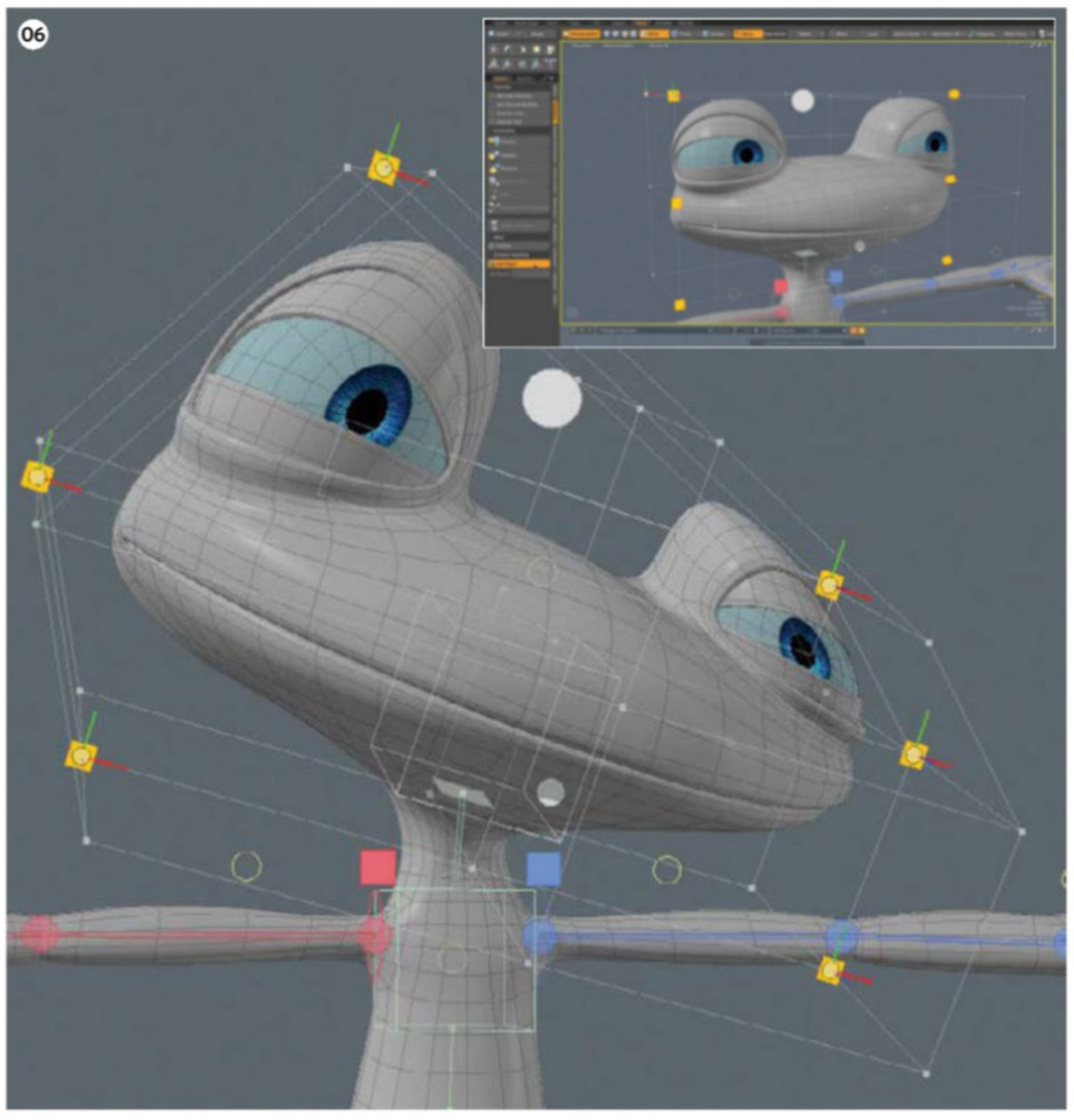
04 Add controls for the Lattice We can of course control the Lattice Deformers by selecting its individual points, but it's more convenient and quicker to control multiple points under a single locator. In this example we'll use one for the upper-left, mid-left, lower-left and then the same positions for the right side to get a total of six controllers. Create a new Locator in the scene, move it into place as shown and give it a descriptive name like 'Lattice_R_Upper_CTL'. Repeat until you have all six locators in place. To dress up the rig we can replace the default locator shape with a more pleasing custom shape. This is subjective so choose the shape, colours and size you'd like. We've selected a Yellow Rhombus shape.

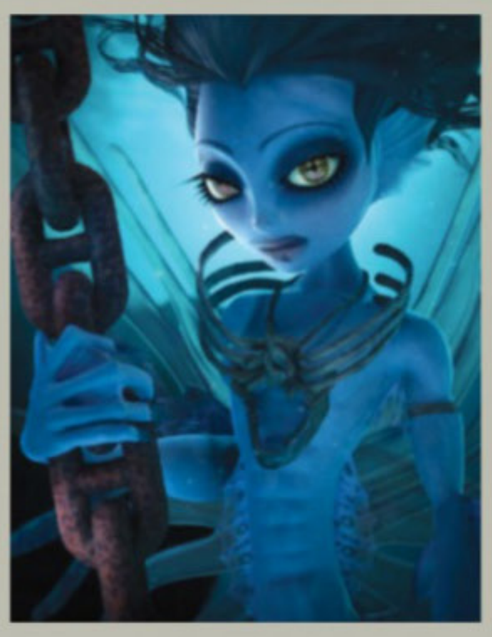
05 Add controllers to rig Next we need to add the Lattice controllers to the rig. Enter Setup Mode and select all six locators. Shift+Select the head bone and press P to parent the locators to the Head bone. Deselect the head bone. With the locators selected, zero out all of the transform channels in the Properties tab. The controllers will now follow the head bone. Now that the locators move with the head bone, we need to start attaching them to their respective Lattice points so they can deform the mesh.

06 Use Dynamic Parenting Enter Setup mode and turn on Compensation at the top. Let's start with the Right Upper controls first. In this order select one of the upper Lattice control points and Shift+Select the controller. In the Dynamic Parenting side tab select Add Parent. Repeat these steps for the two remaining upper points. The three upper points of the Lattice are now controlled by the controller locator. To test your work, exit Setup mode and move around the controller. If everything is working as desired, repeat these steps for the remaining five locators. Now we can hide the Lattice Effector in the Item list by clicking on the eye icon.

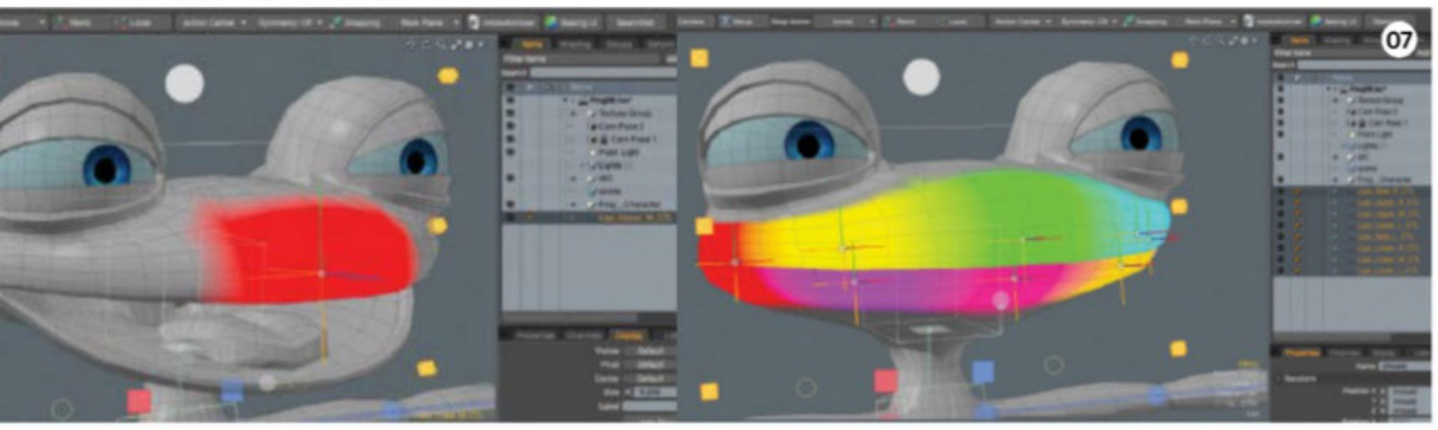
New Lattice tip

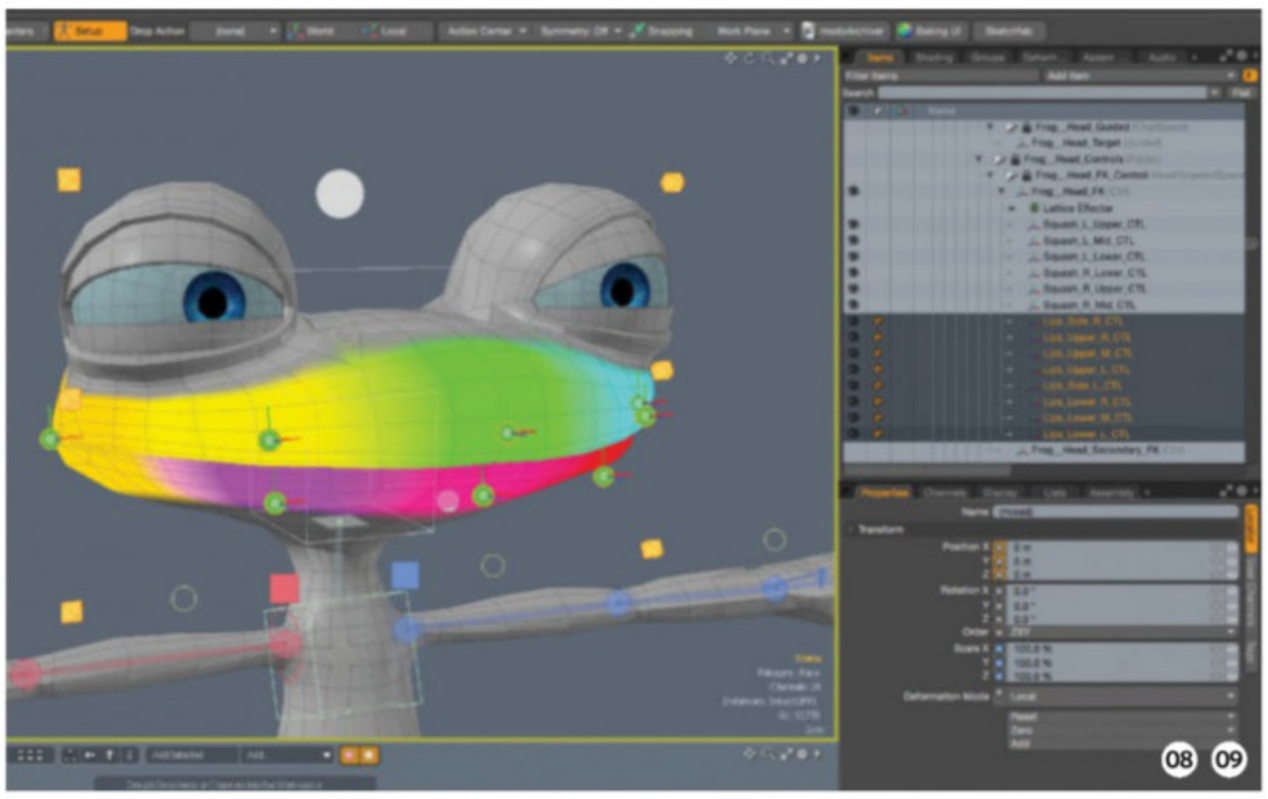
For added speed and convenience when using the new Lattice, consider assigning a command action to the locator. This command can activate various transform tools by just clicking the locator in the viewport. Select your locator and in the lower-right of the UI go to Assembly>Utility>Command and select the preset action you'd like to evoke. We've chosen the Transform tool which offers Move, Rotate and Scale all together.

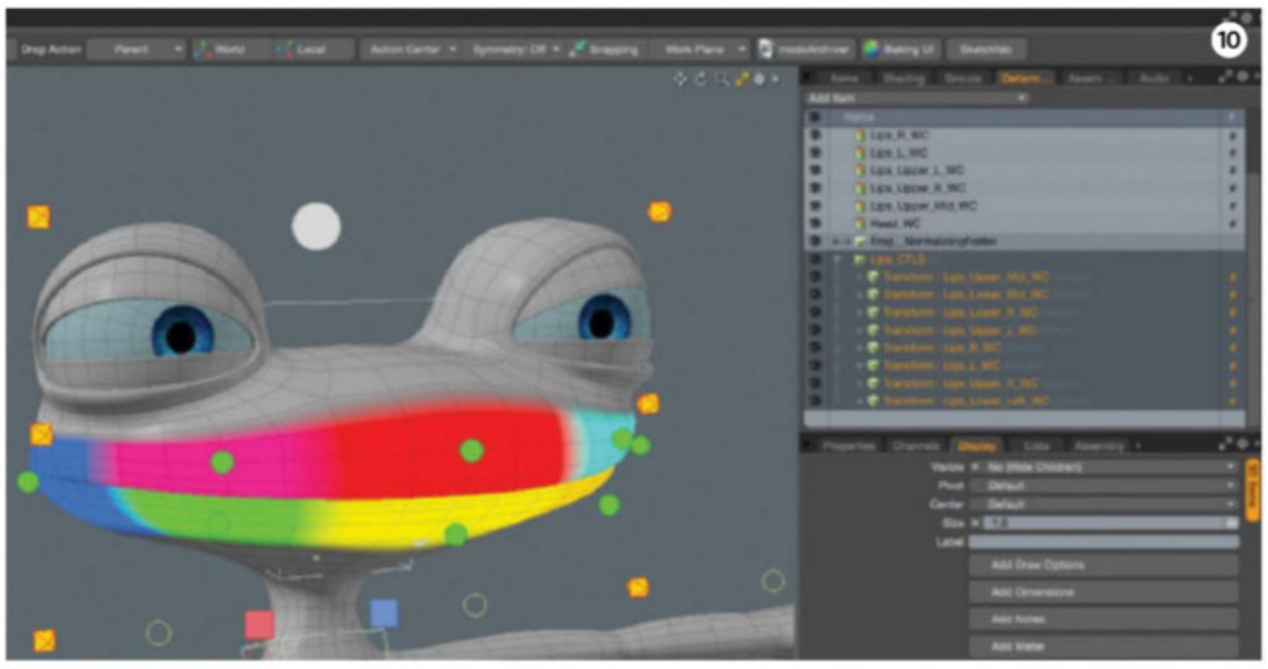


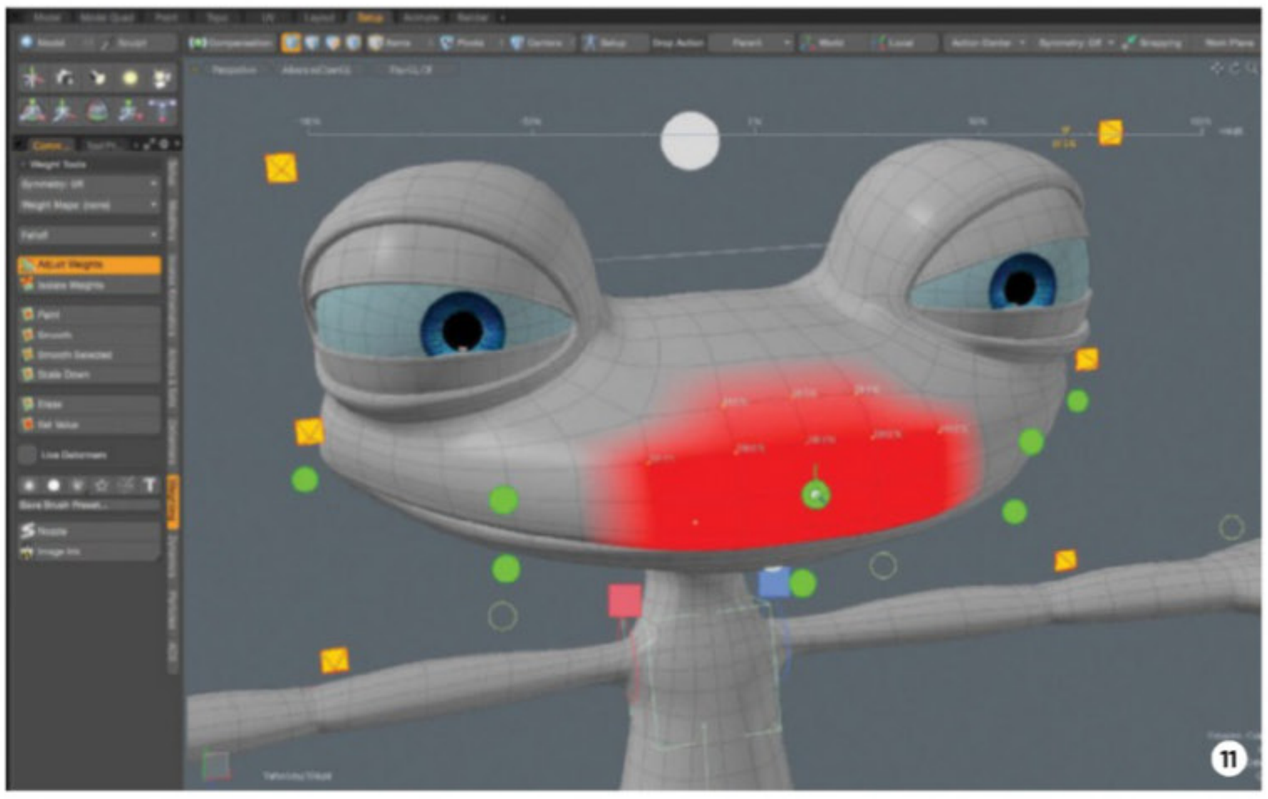


Lagoon Lady
MODO (2013)
The creature from the Black Lagoon reimagined. It was created for a Foundry Community Hallowe'en project.









07 Use Transform Effectors on the lips Starting with the upper lip, select the polygons around the middle of the upper lip and choose the Transform deformer in the Mesh Deformer side tab. This does two things: one, it assigns a weight map to the selected points and two, it gives us a locator or Transform Effector by which to control it. Repeat this step around the upper and lower lips. We're using eight TEs to control the lips, but you can use however many you want. Once complete, be sure to give each TE a descriptive name. For better access to the interior of the mouth when selecting the geometry, temporarily open the mouth via its animation controller. If the character does not have a jaw control you can alternatively create a temporary Morph Map and influence to open and gain better access to the mouth.

08 Position the lips' Transform Effectors Enter Setup mode and move the different TEs outside of the mesh and into a better position so they are more easily accessed. Select the five upper-lip TEs (including the ones on the sides of the lips) then Shift+Select the head bone and press P to Parent them to the head bone. Select the remaining three lower-lip TEs and parent them to the jaw bone so they will follow the jaw when it opens and closes.

09 Position the lips' Transform Effectors cont. Select all of the Transform Effectors, zero out their transform properties in the Properties tab, and change their deformation mode from World to Local. This assures that we don't get a double transformation when moving the head bone. Next you can elect to assign custom locator shapes to the TEs in their display properties. We've chosen a solid green circle.

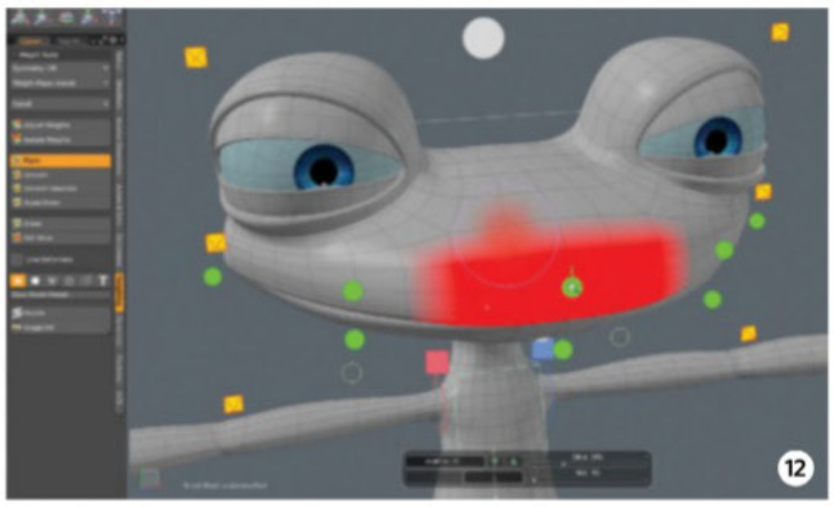
10 Normalise the Effectors In final preparation for the lips' deformers we need to normalise all of the Transform Effectors and then move them into the correct order in our Deformer stack. With all of the TEs selected, choose the Normalizing Folder in the Deformers side tab. This groups all of the TEs together, enabling all of the TEs' weights to work together as one deformer and not separately. Finally, we need to move all of the TEs below the bind normalising folder in the Deformers tab as deformers are evaluated from the bottom up and we want the lips to fire before the skeleton deformers.

Work faster by using the Radial Falloffs

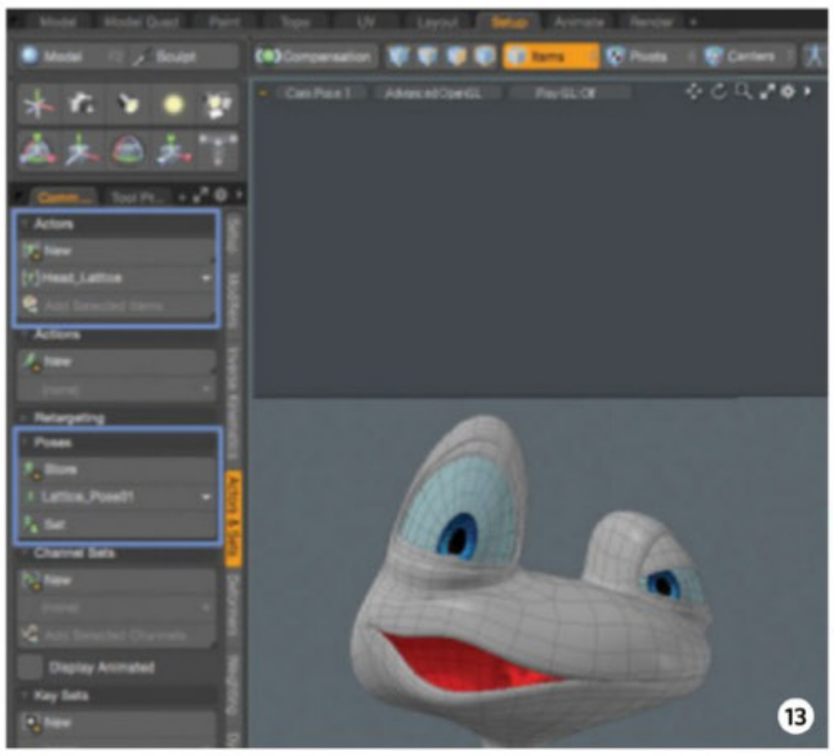
Radial Falloffs can really save some setup time if you want to quickly deform parts of the mesh. They do a good job at deforming and don't require weight maps to work. They lack the precision found in other deformers but, often, they give you what you need quickly.

11 Adjust weights Test the TEs by pulling them around to see how the mesh is deforming. You may need to adjust the weights from the TEs so that the deforming mesh is smoother. MODO offers many tools for adjusting weighting in addition to the paint weight tool like the Adjusting Weights tool, Smooth, Smooth Selected and others. For more precise control over the weights, select the vertices you want to adjust, run the Adjust Weights tool and drag until you get the desired results. For faster viewport performance turn off the Live Deformers and consider hiding any geometry that is not being affected, like the lower body.

12 Adjust weights cont. Select the TE you want to start with, and using a lower Offset amount of 30%, begin painting/smoothing out the weights by holding down the Shift key while painting. This creates a smoothing effect and works nicely for this job. Holding Ctrl inverts the tool, which will remove weighting. Move through the different TE weight maps, smoothing as you go. Check your work by periodically pulling the controllers around to see how the mesh is deforming, taking care to reset or undo the controller to its start position after you test it until you're happy with the results.



13 Set up Actors and Poses You probably want to get on with posing but before we start, let's set up a way to save poses that we create. MODO does this through Actors and Poses. An Actor is a collection or group of Items from which Poses can be created and stored. With Actors we store a Pose (or Poses) nondestructively and recall them quickly. Think of Poses as a container for an Actor. We'll be adding two Actors to this scene: one for the Lattice and one for the Lips.



What about Morph maps?

Morph maps are another great way to deform the mesh and offer very precise control over the mesh nondestructively. You can use them in conjunction with or without a rig. Morph maps work in Component mode (not Item mode). First select the mesh and from the Lists tab select New Morph Map. The name of the Morph Map will appear in the lower-right of the viewport when active. Use MODO's modelling and sculpting tools to deform the mesh, and when you're done, right-click on the morph name in the Lists tab to apply it as a Morph Deformer. Morph maps will not render without a Morph Influence (Deformer) applied to it. You can create many Morph maps but can only work with one at a time.

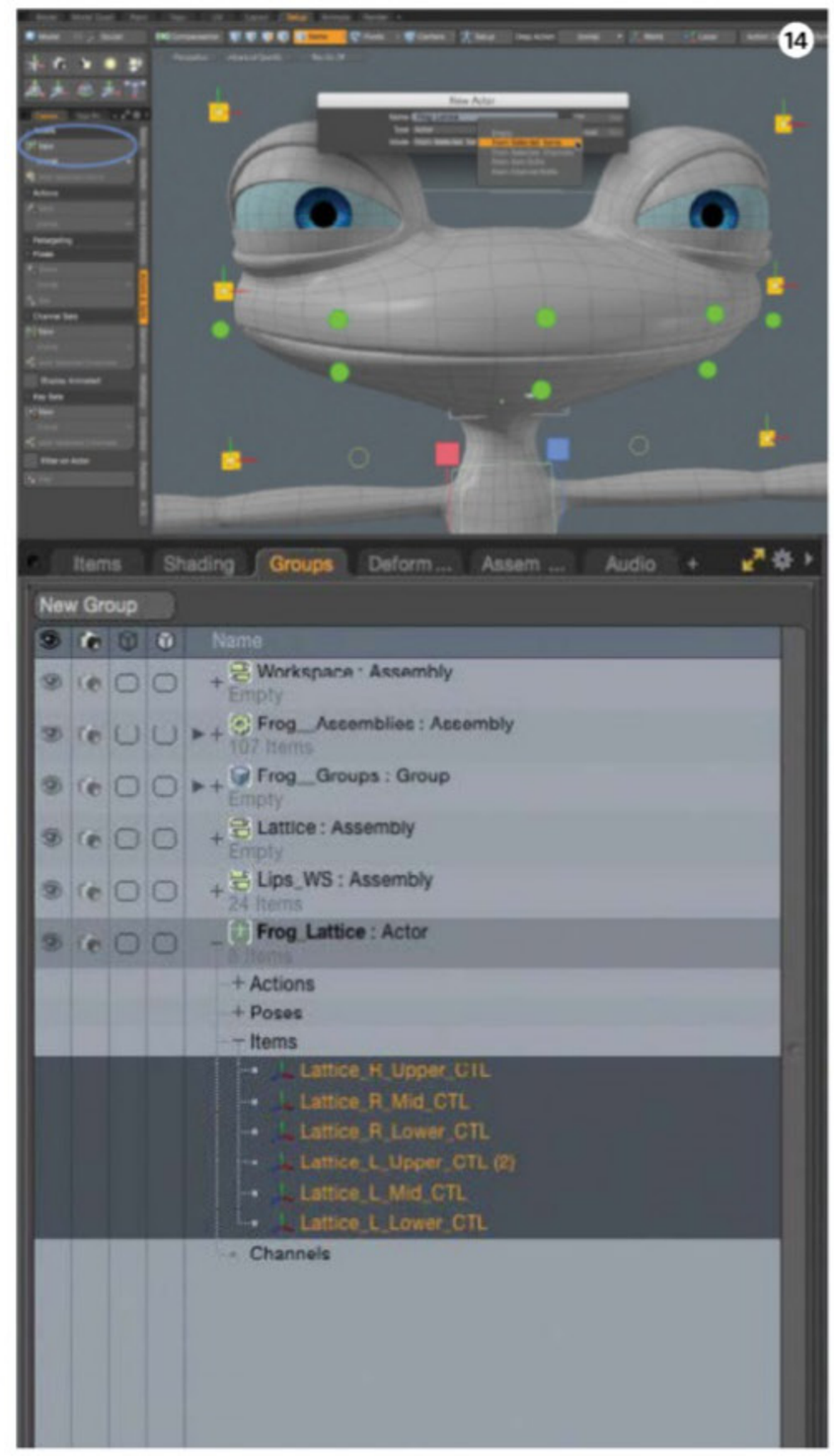
Concept

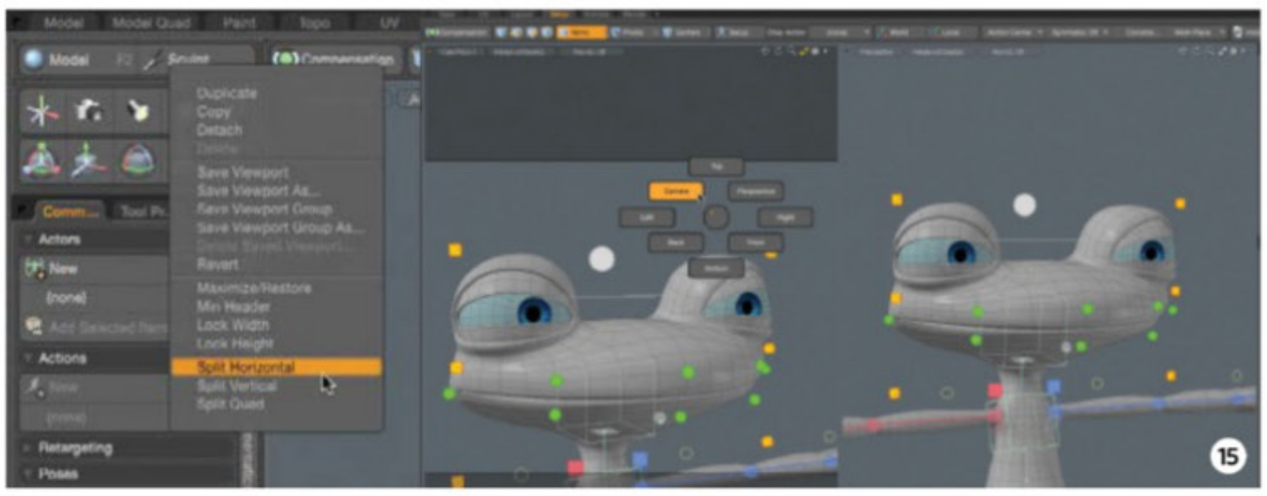
Choosing a subject for this tutorial was quite fun. My original tree frog character blu-E was a perfect candidate for a tutorial on MODO Deformers because he's so flexible.

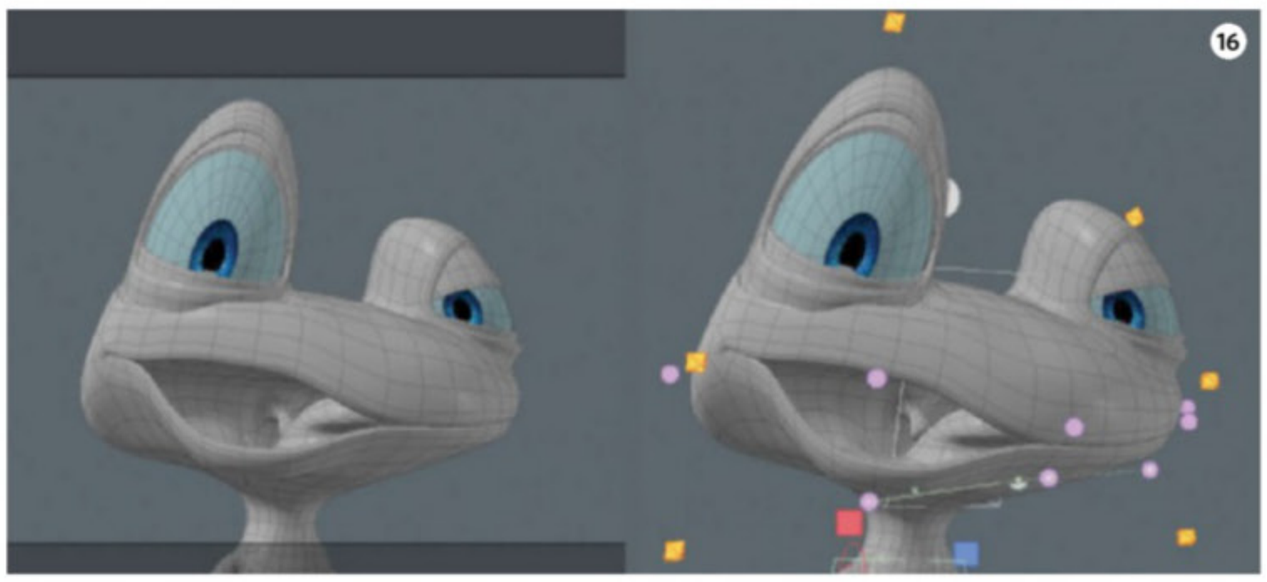
14 Set up Actor and Poses Select the six Lattice controllers and in the Actors & Sets side tab select New Actor. Let's call it 'Frog_Lattice' and make sure the Mode is set to From Selected Items. You can see the selected items in the Groups tab under Items. Next, with the Frog Lattice Actor selected, click Store under the Poses subtab and label it 'Rest'. As you are posing your model and need to recall this Rest position, select the Frog_Lattice Actor, choose the Rest Pose and press the Set button. Create the second Actor, call it Frog_Lips and repeat the previous steps. Now we have two new Actors with one Pose each (Rest).

15 Set up posing To begin posing the model, first split the viewport so that the camera view is on one side and the perspective view on the other. This lets you freely navigate in the perspective view whilst keeping the camera stationary for composing the shot. In the Shading tab select the render node at the top of the Shader Tree. Then go to Properties>Frame and set your render size. If you have multiple cameras make sure the Render camera is set to the correct one. Next, select your Camera in the Items list, set its focal length to your preference and then begin positioning the frog into place for the shot(s).

16 Pose the character In Item mode, use the controls we have in place to let your creativity come out and start manipulating the controls to evoke all kinds of emotions. When you're happy with a pose, be sure to save/store your Pose by selecting the appropriate Actor and choosing Store under the Poses subtab for each Actor you have manipulated. Continue to build your library of poses taking care to store them as you go. Keep in mind that you can combine the various stored poses from different Actors for more variations.







Thoughts on posing the model

When posing your model, it's best to use the camera viewport for the most accurate composition. As you are composing your shot, look at the character's silhouette and expression. Does he convey his intent or emotion adequately? Ask yourself this: is the pose strong enough? Can you exaggerate or push the pose more? Does the lighting play a roll in the shot for dramatic effect or mood? Use the Preview window to check your textures, colours and lighting. Consider the use of multiple cameras in a scene so that you can explore different angles or focal lengths.

17 Conclusion This tutorial only scratches the surface of the deformation tools that MODO offers. As you explore these tools and others keep in mind what you want to accomplish with your project and then choose your method based on these ideas. Of course, if you don't have a specific goal in mind and just want to do some fun character exploration then MODO is your playground.

• **DID YOU KNOW?** • All tutorial files can be downloaded from: **filesilo.co.uk/3dartist**

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Technique focus

Incredible 3D artists take us behind their artwork

STILL LIFE RENDERS Most of the modelling was done in Maya with a few pieces brought into ZBrush for further detailing. Lighting was done with mental ray area lights. Texturing was mostly done with photo manipulation, with a few hand-painted. This is probably my favourite piece from my student portfolio because it was such a big learning experience. **Pear Still Life,** 2014

Rusty Currier

Website www.curriercg.com

Country USA

Software used Maya, mental ray, ZBrush, Photoshop

Bio Rusty is a computer animation graduate passionate about modelling, texturing and lighting

Referenced from still life photography by marasapego **www.flickr.com/photos/27507701@N02**

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3ds Max, Photoshop
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www.artisaverb.com

Andrew works in the games industry and is the senior artist responsible for the technical art direction of a next-gen project. He also gives lectures in his spare time

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The final render of an advanced rain system

Create advanced rain with Particle Flow

"How do I make a rain system with 3ds Max?"

Rain systems do not have to be complicated – in this tutorial we're using 3ds Max to create one with Particle Flow. We are going to start off by opening up the file Advanced Rain PFlow Start that we have put on FileSilo for this issue. This file has three different preanimated models for the Particle Flow system and we've also included scene files for versions 2012 to 2015 of 3ds Max and two ground models for the rain to bounce off. If you want to create the animated rain models for the tutorial – there will be an additional video on FileSilo and also on the **3D Artist** website **(www.3dartistonline.com)** for you to check out. It's called Adv Rain Modelling so just open that up along with the file Advanced Rain Clean Start and you will be ready to go.

Effects like this are important because sooner or later a client will ask you for rain in a project. Particle Skull creates tutorials specifically for 3ds Max and Particle Flow, simply because we like the philosophy and complexity that you can run into, and figuring a system like this out is quite an enjoyable process.

Other Particle Skull tutorials cover different aspects of 3ds Max's Particle Flow systems. They're worth a look if you are interested in learning about or working with the more advanced data suboperators for particle manipulation.

If you want to create something realistic, like for our rain system, you really need to dig up as much reference as possible to understand the look and feel of what you're trying to re-create.

growing community at www.3dartistonline.com

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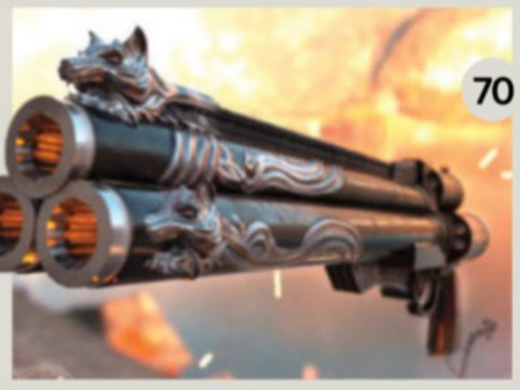
Rainer is specialised in procedural modelling techniques, creation of visual effects such as fluid, fire and destruction systems, and physically based rendering too

ZBrush, Maya

Tom Parker

tomparkersartdump.wordpress.com/gallery

Tom has been working in the games industry for over six years and worked for studios too. He is now a freelance character artist, working with clients from all over the world



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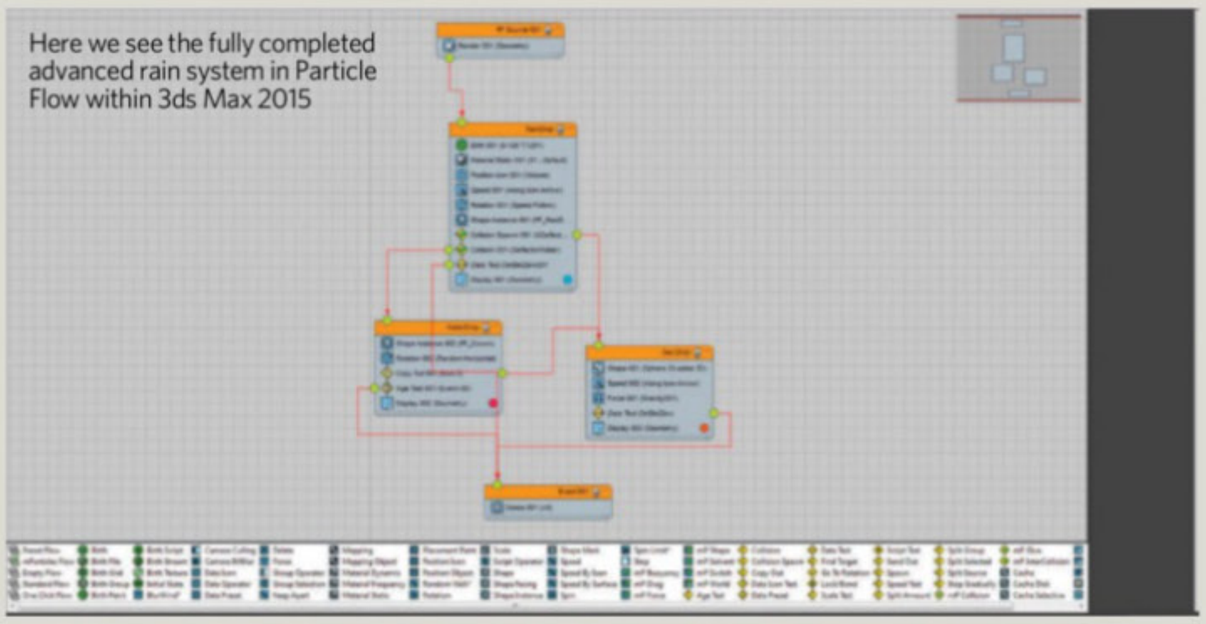
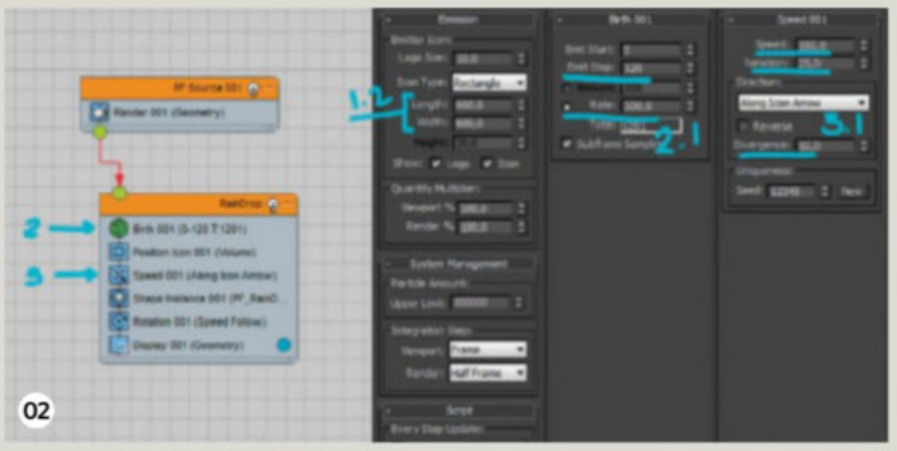
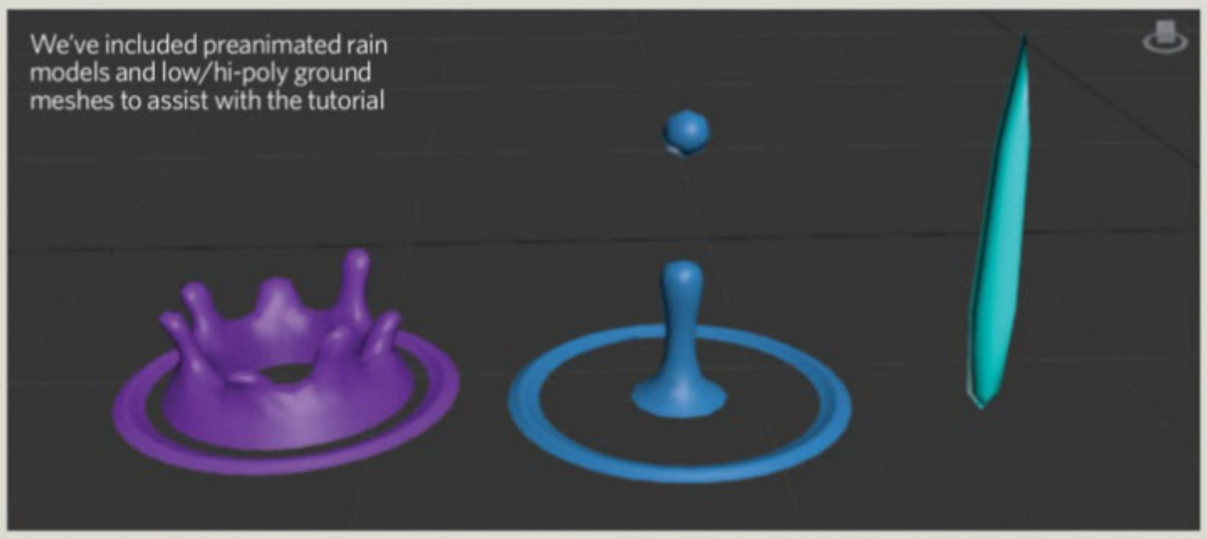
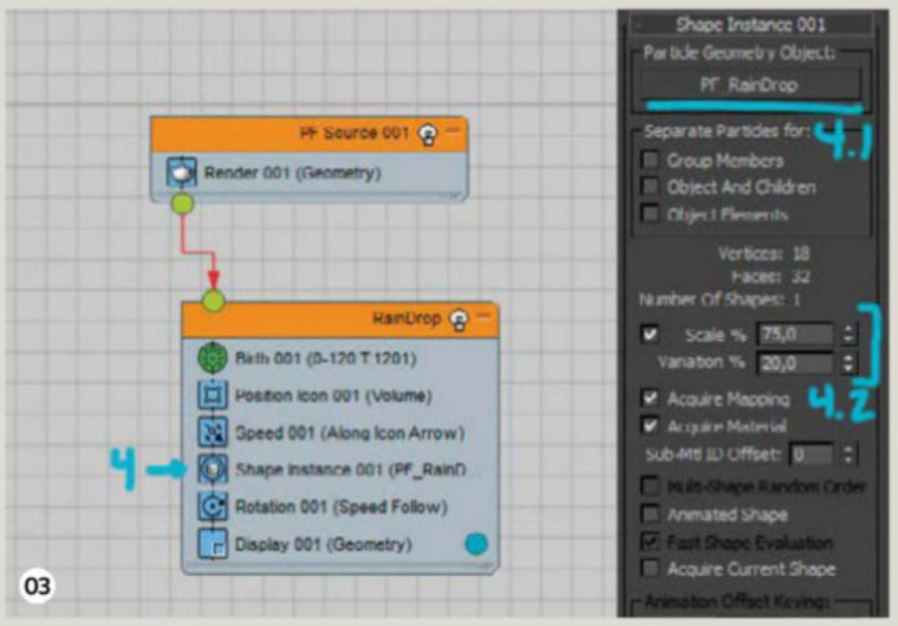
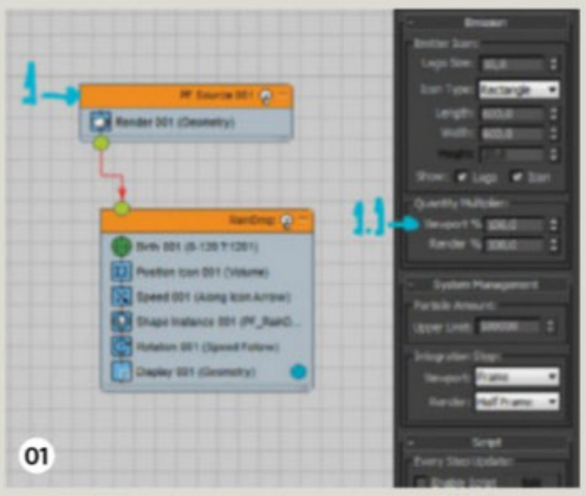










01 Set up the scene

Open up Advanced Rain - PFlow Start, press 6 for Particle View and drag a standard flow into the viewer. Select PF Source 001's node and then change the Quantity Multiplier from 50 per cent to 100 per cent so that we can see all of our particles in the viewport. We want to change the height of the icon by moving it up to 115 units in the Z axis. Next we want to align the icon to the ground mesh by pressing Alt+A, click on the Street Mesh, check the X and Y check box and hit OK.

02 Change the birth

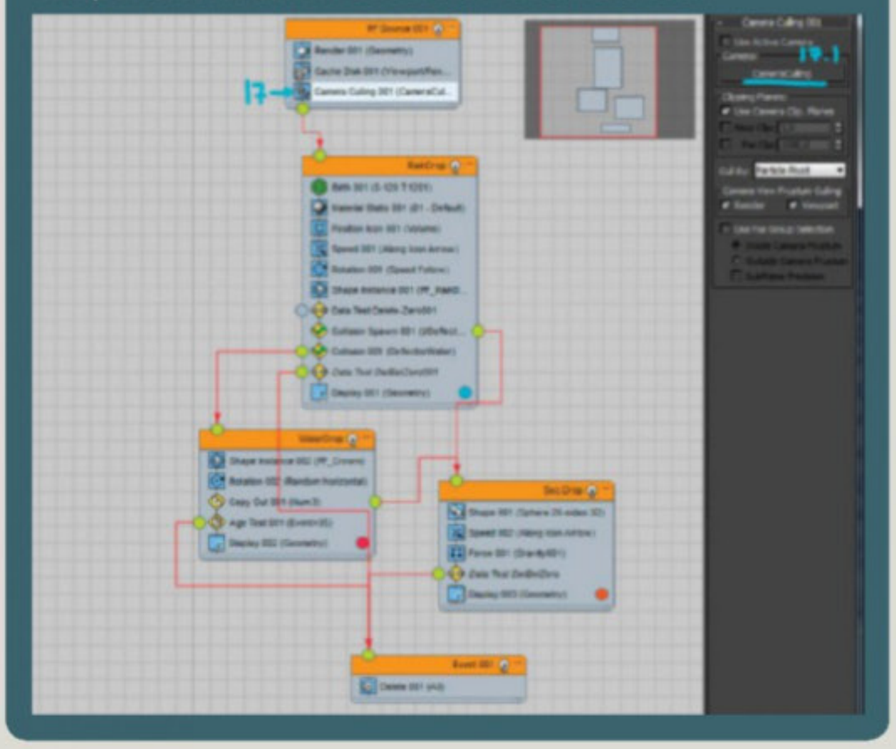
Go to Source and change the length and width to 600 so the system is larger than the mesh. Hit Ctrl+Alt, right-click and drag the time slider. Move it until it's 120 frames. Go to Particle View, click on Birth operator and change emit stop to frame 120. Then change the particle's Birth Amount to Rate and keep it at 60.0 (it means 60 particles per second). Add a Speed Operator and change Speed to 150, variation to 25 and Divergence to 10 per cent.

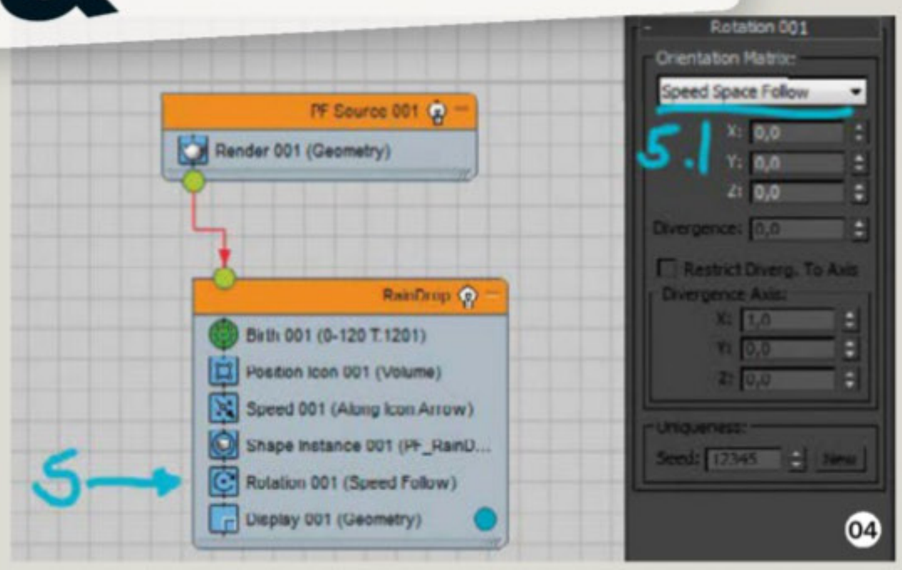
03 Make the shape

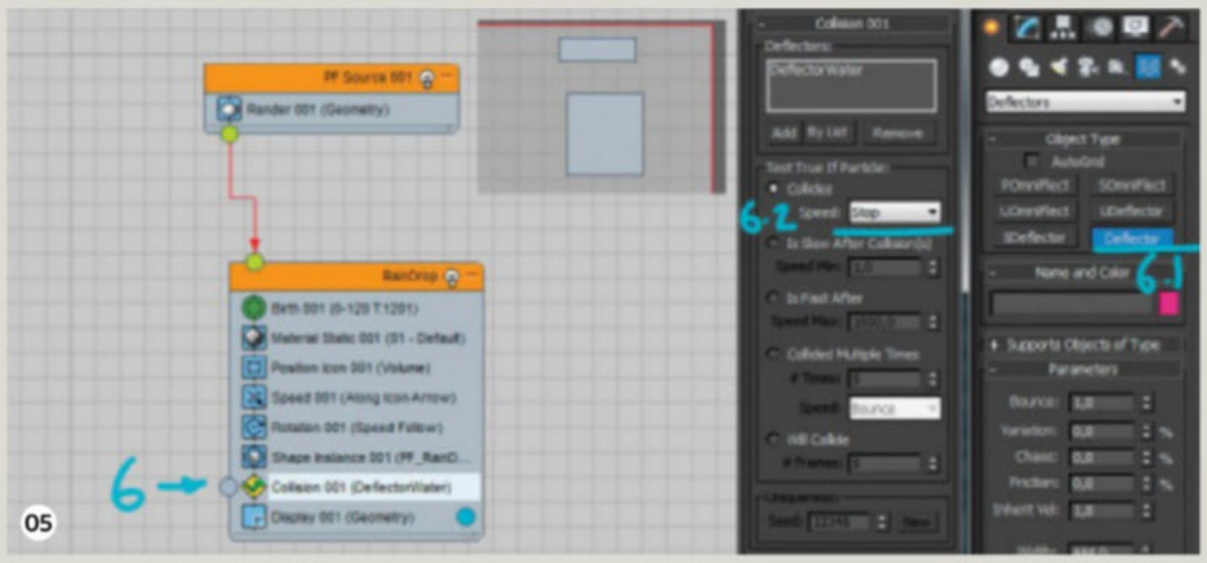
Replace the Shape operator with a Shape Instance (just drop the shape instance on top of it). Select the box that says None and press H to display all of the objects in the scene and then click PF_RainDrop. This object will be our starting shape, although the model is too big so we will want to change the size of the particles so that it's smaller. Go to Scale % and then change the value from 100 per cent to 75 per cent with a variation of 20 per cent.

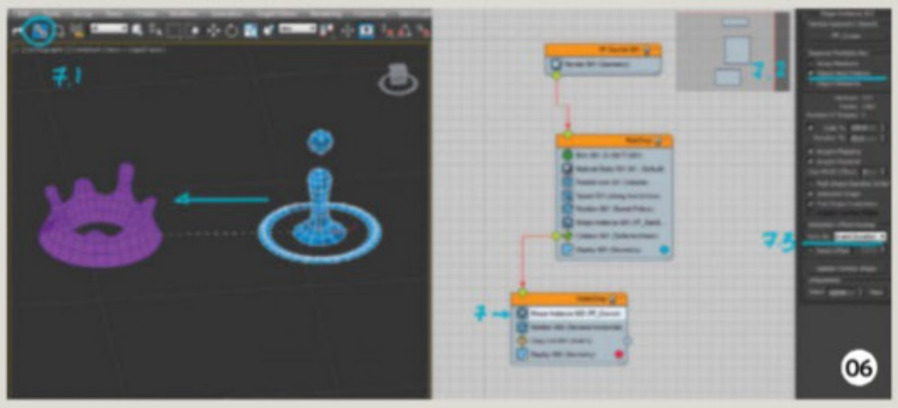
Camera culling

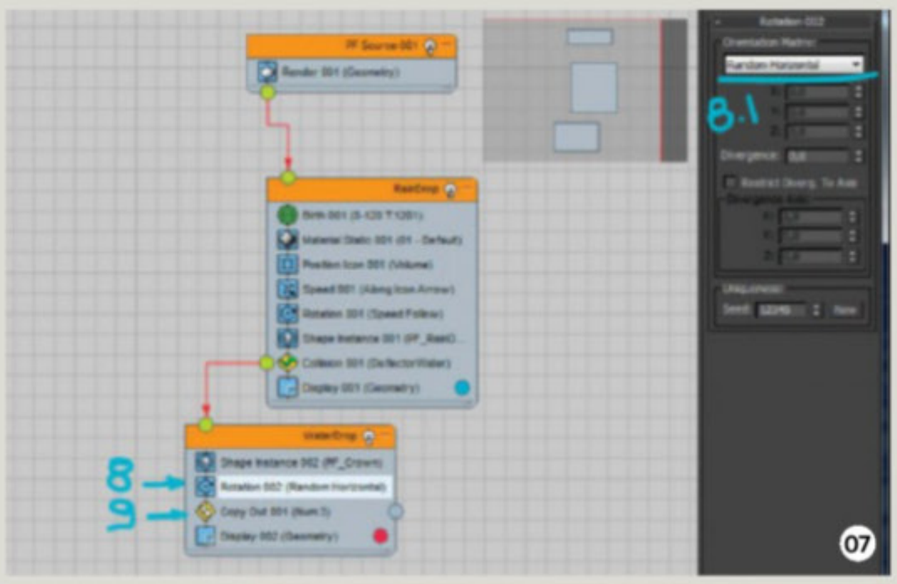
We want to delete the particles outside of the camera view. To do this, select the camera, press Ctrl+V to make a clone and select copy. Name this 'CameraCulling' and hit OK. Select the camera clone and change FOV to 52. Go to the Particle View and add a Camera Culling operator below the Render node at the top of the flow. Put the camera named CameraCulling into the Camera: option and it should delete all of the particles outside of the original camera view. Now, select the camera viewport and hit C, then select the first camera back.

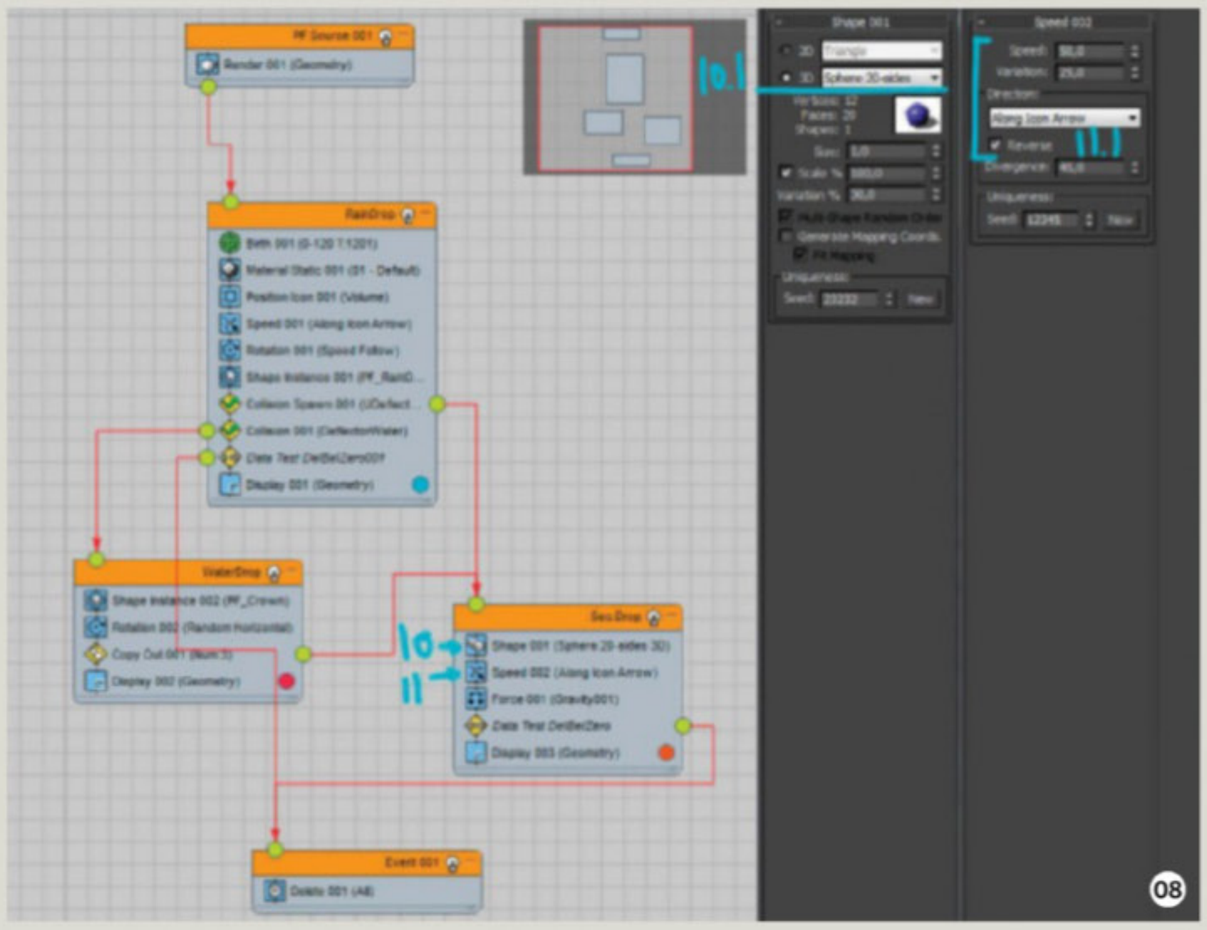






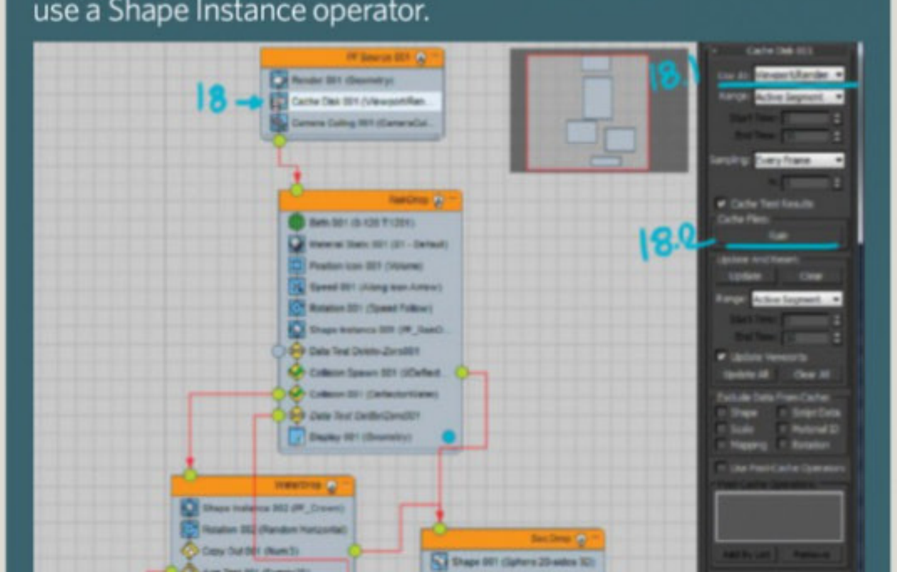






Cache operator and displays

Add the cache operator between the Render and Camera Culling operators. Change the Use At: option from Render to Viewport/Render. Uncheck Update Viewports and specify a file for the system to write to. Now that you've done all of this, select Update and wait for it to cache. Another tip is to make sure that you always remember to change the display to geometry if you use a Shape Instance operator.



04 Add a rotation operator and correct the hierarchy

We need to put a Rotation operator into the flow. Add it and change the rotation type to Speed Space Follow. Now select the PF_RainDrop model and go to the Hierarchy tab to change the pivot of the model by hitting Affect Pivot Only and rotating it to 45 degrees on the y axis. The particles will now go in the correct direction. We also want to change the position of the PF_Crown and PF_Drop's pivot on the Z axis to 0.0 so that the animation will work correctly in Particle Flow.

05 Edit the deflections

Go to Space Warp>Deflectors and click on Deflector. Drag and drop it, and then change the width and length to 444. Align it like before (Ctrl+A and click on the WaterPlane). Add in a Collision test and add the Deflector into where it says Deflector. We need to change it from Bounce to Stop, so that it will stop on impact (and later change its shape).

06 Link and sync

We need to link the two remaining animated models (PF_Drop to PF_Crown) by hitting Select and Link. We also need to drag out a Shape Instance as its own event. Add the PF_Crown only by hitting H and selecting it. Then check the Object and Children checkbox, hit Animated Shape and change the Sync By option from Absolute to Event Duration. It's very important that you tick Object and Children so that the system will be able to distinguish between the two shapes. Now you can connect the Collision Operator to the second event.

07 Rotations and copy outs

Name the first event 'RainDrop' and the second can be called 'WaterDrop'. Add a Rotation operator to the WaterDrop event just below the Shape Instance and change its Orientation Matrix to Random Horizontal. Add a Copy Out operator just below the Rotation operator. A Copy Out operator will define a number of copies. Change it from one to three so that we have three copies instead of just one.

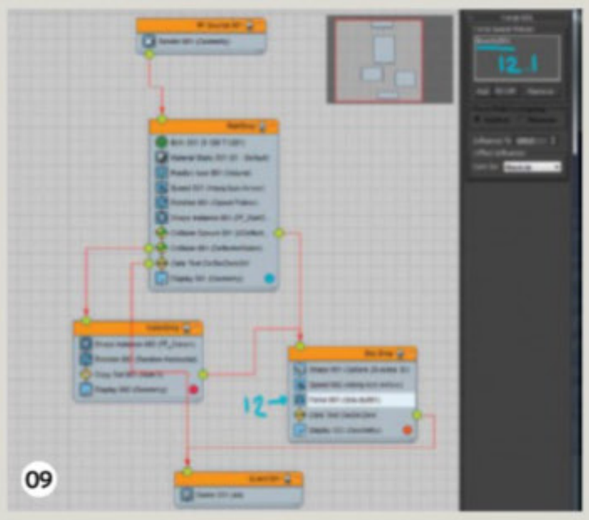
08 Make the shapes and speeds smaller

We don't want to create three copies of this waterdrop so let's repeat what we did with

the shapes, which is to add in a third event with a Shape operator to create some round droplets. We'll call this third event 'Second Waterdrops'. Change the shape from Box to Sphere 20-sides. Now we want the copies to have movement. Add a Speed operator with a Speed Value of 50, Variation of 25 and tick Reverse so that the new particles will shoot up. We want the Speed Operator below the Shape.

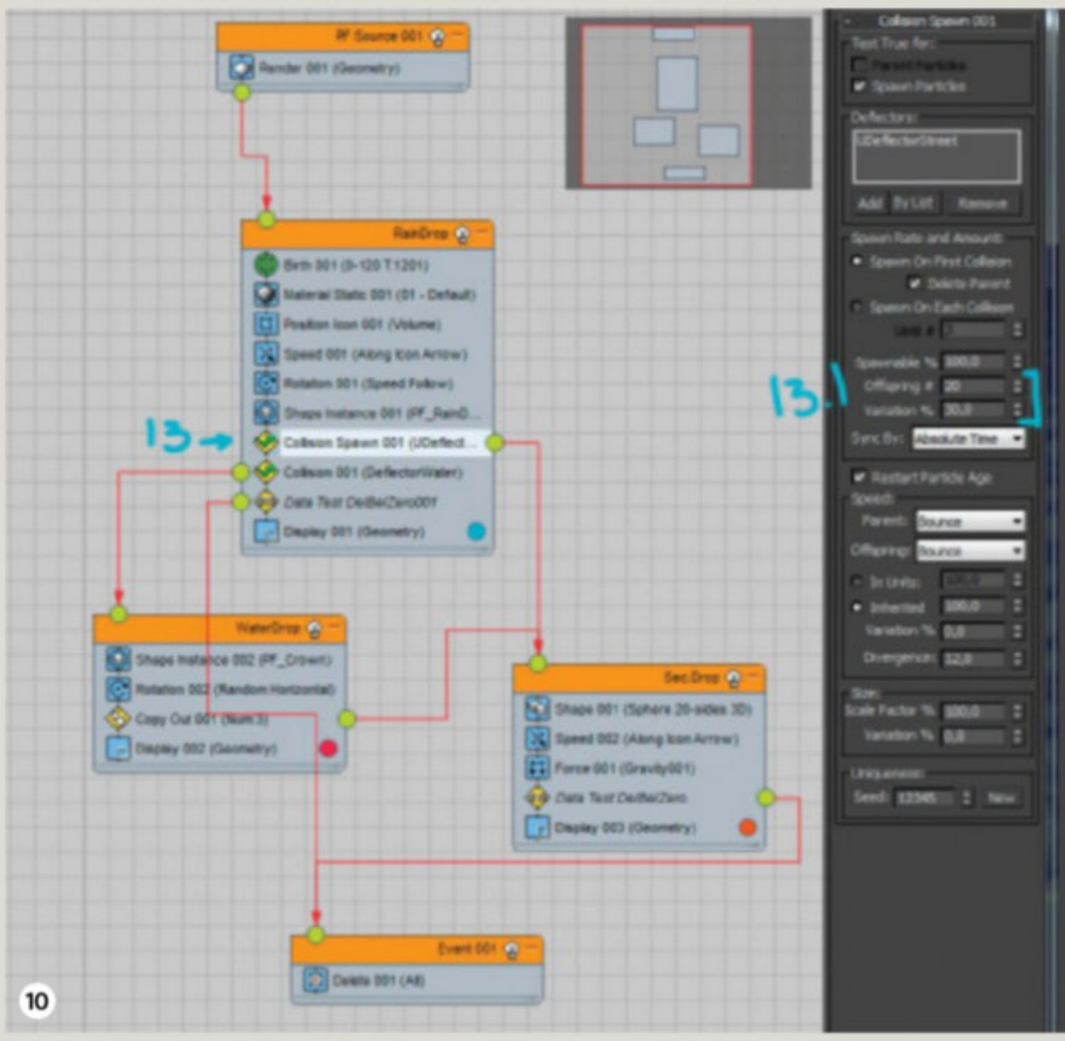
09 Control collisions by using deflectors

Go to Forces and add Gravity into the scene (make sure the gravity is pointing downwards). Now we need a Force operator, so add that in below the Speed operator with an influence value of 180 and add in the Gravity. The next important thing is the collision of the ground object, which we can control better with a UDeflector. We'll add the low poly street into the UDeflector by clicking None, pressing H, selecting the low poly and hitting OK.



Accurate integration

Always look at your integration steps. Half frame will produce a more accurate simulation, but we used frame in this system. At the end we've changed the viewport integration step to half frame and the render to an eighth frame – this makes the viewport preview faster and the render more accurate. You'll need this accuracy to have precise collisions between rain and water/ground.

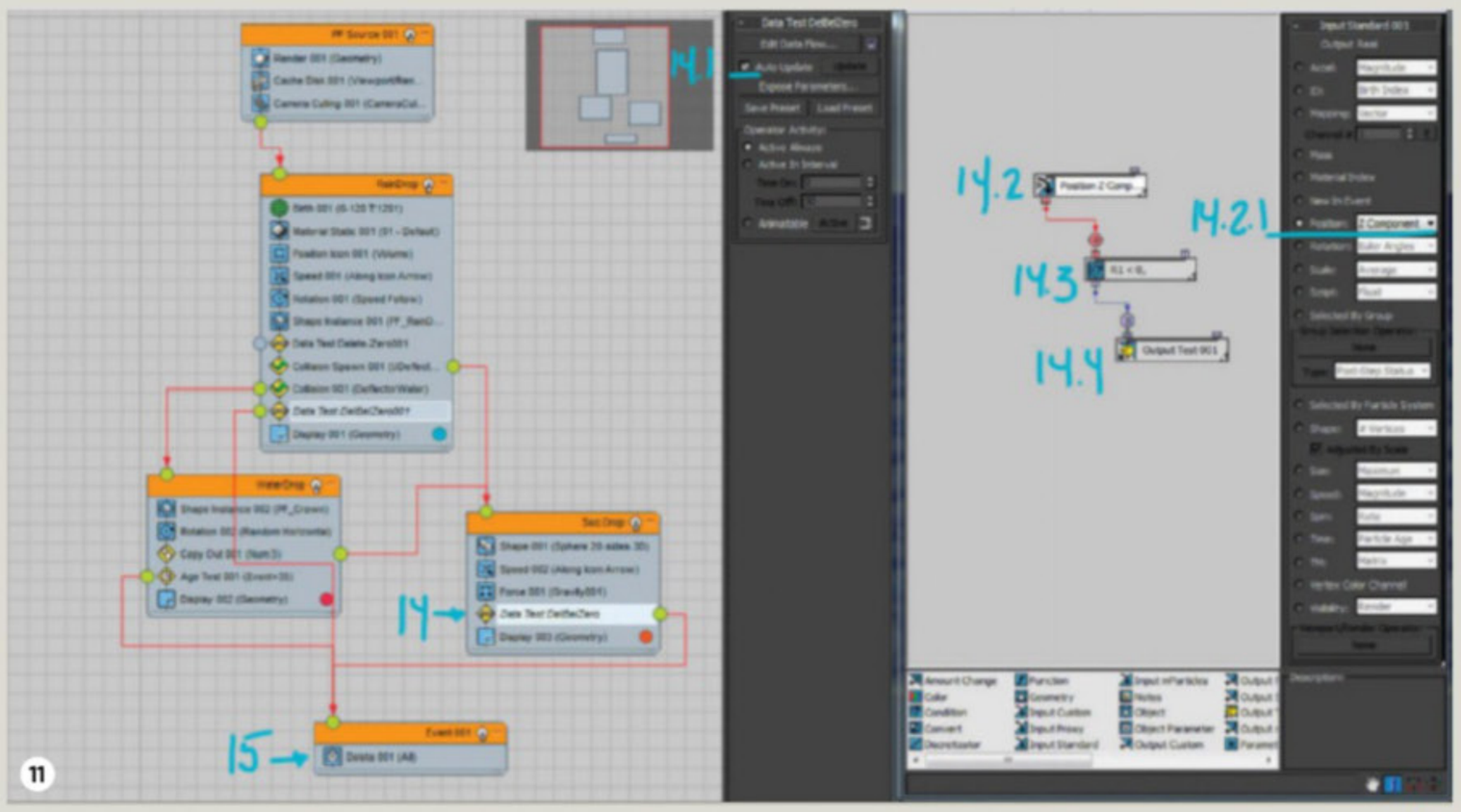


10 Connect collisions for the offspring

Particle Flow can do this by adding a Collision Spawn, which will make the particles spawn some offspring to another event when it collides. Add it to the RainDrop event, just above the Collision test. Connect Collision Spawn to the Second WaterDrop event and add in the UDeflector to the Collision Spawn with an Offspring of 20 and Variation of 30 per cent. The Collision Spawn will create new particles from the raindrop particle's collision.

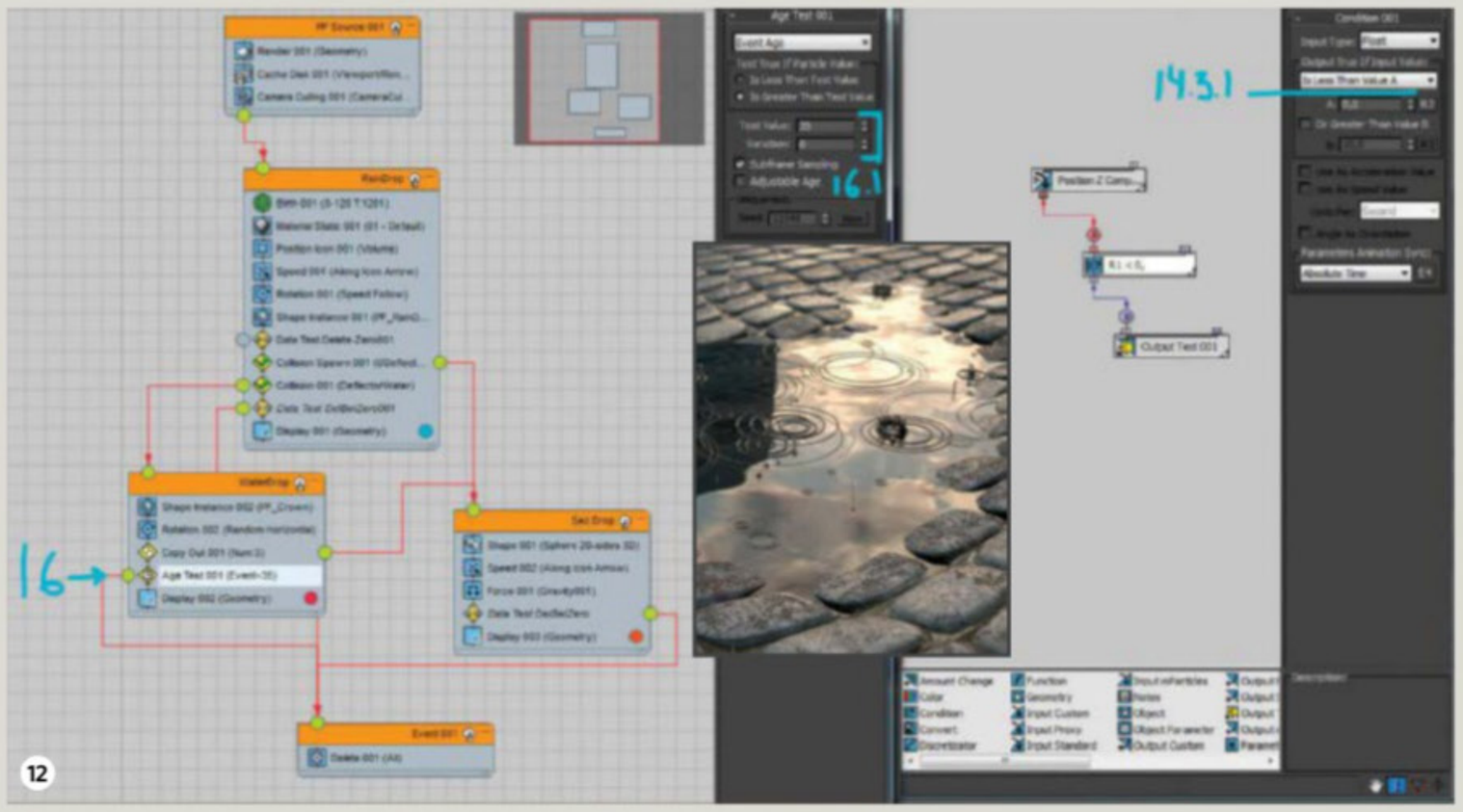
11 Use data tests for events and optimise

In the Second WaterDrops event, drag out a Data Test above the Display node and tick Auto Update. We need an event to connect this test to. Drag out a Delete operator like we've done before and connect it to the Data Test. Drag out an Input Standard, Condition and an Output Test suboperator. Change the Input for Position from Vector to Z Component so that it only uses the Z axis.



12 Data operators continued

In Condition we need to change 'Is Greater than Value A' to 'Is Less than Value A'. Now connect the three together. We need to Shift-drag the Data Test into the first event to make it a copy and then connect it to the Delete event as illustrated. This will delete all the useless particles, which are below the 0 height. In the WaterDrop event add an Age Test below the Copy Out operator. Connect it to the Delete event that we created. Change it to Event Age and the Test Value to 35 with Variation to 0.



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Next-gen texturing

“How can I produce and texture materials that are ready to be used with the next-gen consoles?”

Seeing a new console generation is an exciting time for everyone involved in the games industry. We may have all been slightly worried about braving the learning curve for next generation art, but it’s all cleaner and more structured now.

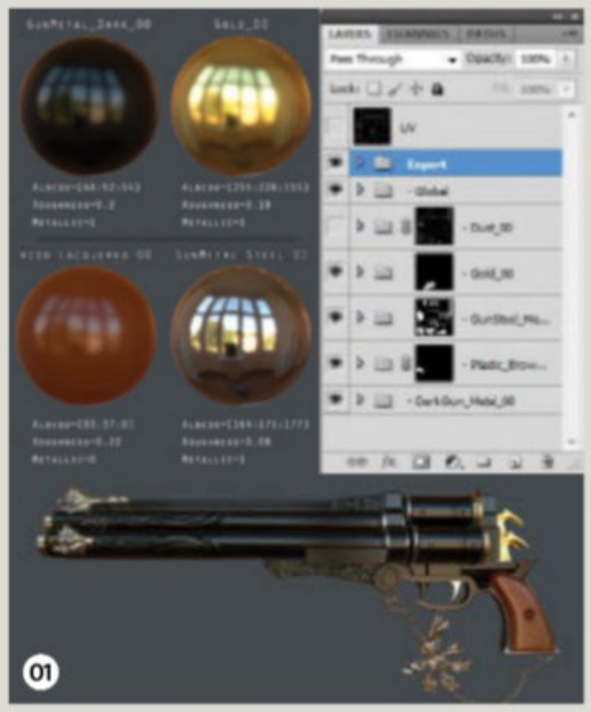
In this workshop we’re going to look at the type of maps you’ll need to produce such next-gen art. We’ll discuss the types of maps you’ll be using in production.

First there’s the Albedo map. Albedo is a natural evolution of the Diffuse texture, but they are not the same thing. While Diffuse is just an image skinned to your mesh, Albedo is a physical property that describes the amount of light bouncing off a surface under neutral lighting conditions. This means that Albedo should be devoid of any kind of specific lighting info, like ambient occlusion or specular highlights.

With the specular map, real-time graphics evolution has made it no longer necessary to use the specular highlight approximation system as we have reflections now. Remember that with specularity, what you define in physically based rendering engines is of facing angles only. Everything has Fresnel reflections, so your surface’s reflectivity is going to increase the more grazing the viewing angle becomes relative to the surface normal. Now, your engine will use either a specular or metallic map.

The metallic map is as straightforward as it sounds. Objects made out of metal are white on this texture and dielectrics are black. Grey values are usually reserved for transition between layered materials, for example on dirty metal. When this map is used, the Albedo of your metals is automatically set to black and their Albedo texture info is used as specular.

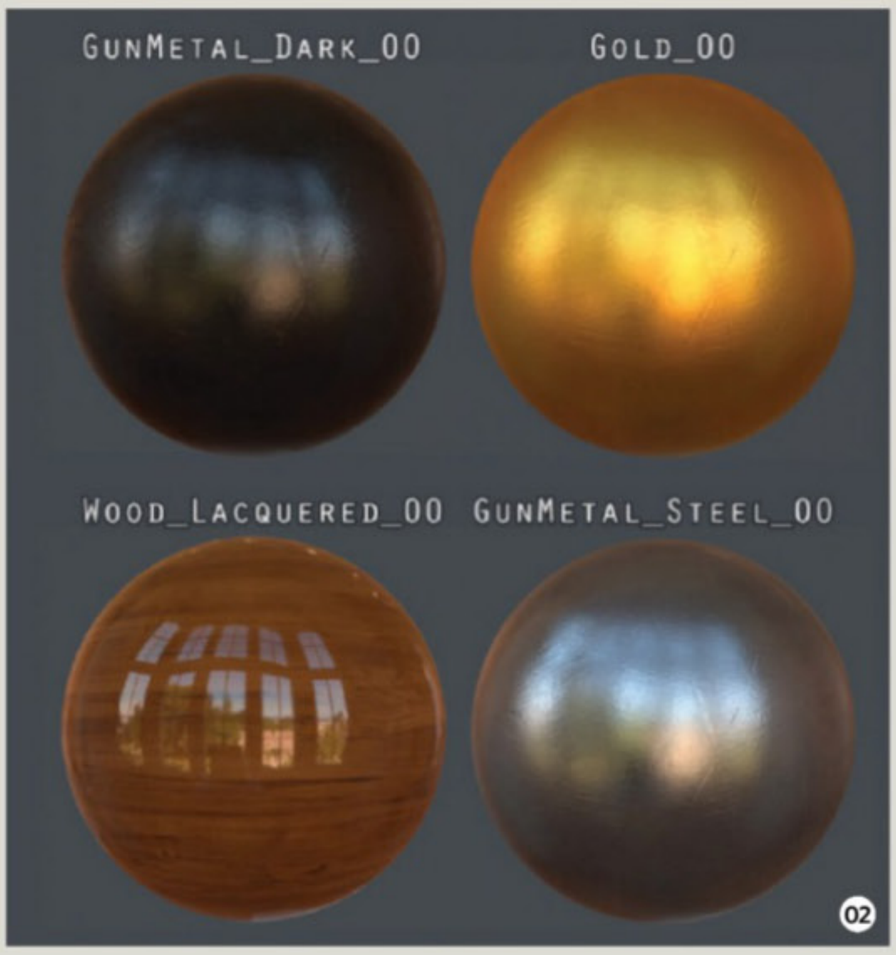
Roughness/glossiness is the map where you get to let loose the most. On one side of the spectrum, you have a perfectly sharp reflection and on the other an extreme blur. To sum up the differences from previous generation texturing: your Diffuse map is now replaced with an

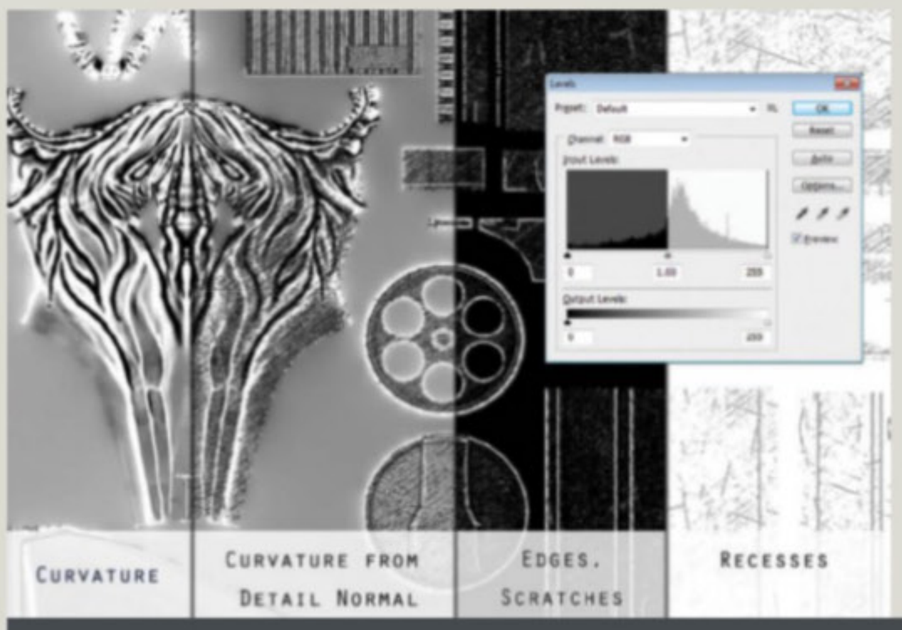


01

Albedo map, your specular values from now on will have to be more consistent with measurable real-world values and every surface type is capable of reflection, just like in the real world, making glossiness/roughness dramatically more important in describing material qualities.

As next-gen art grows exponentially, the best response is to increase modularity and reuse. Get ready to start building your material pipeline around masks and material presets. The ideal asset production pipeline will look like: Identify Material Types>Load/Create Material Presets>Blend them together>Apply Wear, Tear, Decals and One-off Details.





01 Choose your material types for texturing

Identifying types of materials you are going to use is the first step in next-gen texture production. You can be very specific and base your material on a real-world counterpart or go with a more generalised approach. It might be helpful to block out the materials with just plain values and see where it takes you. You can then mask out the materials. This is also a great time to block out some of the masks for your material types inside of your PSD, overlay them with your Normal map and preview the blockouts on the actual asset.

02 Create material presets and add adjustments

The next logical step would be to transform those rough blockouts into fully fledged tileable material presets. They are going to save you a lot of time in the future when producing assets made of similar materials. In the accompanying image you will see what a source material preset might look like. When these are applied to our spheres, you immediately see that we get some nice material definition. This is also a good time to add any adjustments such as colour tints or roughness variation, especially if you are not producing your material preset from scratch, but rather using one you made earlier. You may notice that the metals share a very similar Normal map, which certainly suits us because after we move things around and tile them around, things won't seem so repetitive. If anything, since all our materials are part of the same object, it is reasonable to expect them to be subject to the same kind of wear.

03 Apply material presets

After you've applied the material presets to your model, you'll see that your asset is 80 per cent there and at a distance it could almost look finished. Once you're done with the base materials of your object, all that is left is the wear and tear and whatever unique decals and one-offs you might have.

04 Create wear and tear

One of the great tricks that our layered approach lends itself perfectly to is baking the curvature map using the detailed Normal, created by overlaying our preset material's Normals with the global Normal map. Our curvature map, which is a combination of concavity and convexity maps in one, is baked in Substance. This gives you all the scratches and recesses that match perfectly with your base materials and are very easy to lay down. Select all and press Copy, then hit Q for quick masking mode and paste the mask in. Press Q once more and your mask will be transformed into your selection. Using that selection, paint your scratches in where they would make sense. This way you are still very deliberate in your detail placement, but are still using the generated mask and saving yourself a lot of time. This approach once again will get you 80 per cent there, and from then on feel free to refer to custom texture brushes to finish up the painting of the wear and dirt masks.

Dark metals

If you've ever dug into the theory behind physically based renderers you would probably know that there are no dark metals in the real world. Not in their pure form, at least. However, through the history of arms production, humans came up with lots of ways to treat metals to be more durable, while unintentionally altering their aesthetic properties. The dark metal that we're using in this case would have to be blued steel. Bluing is a special process during which a thin layer of magnetite is created on the metallic surface. Magnetite is a mineral with metallic lustre, and that's why it's still going to be white on the metallic texture. Always research your materials before production, especially for guns as there are a lot of surface treatments, such as case hardening, bluing, Cerakoting, Teflon coating and so on.

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Autodesk Softimage, Clarisse iFX, Photoshop

Build a sci-fi skyscraper

“How do I use fast rendering and compositing to make a tower block that can fit right into a sci-fi scene?”

Usually, artists spend a lot time on the actual creation of each part of their final development and each asset in the scene. The rest of the energy and time of these artists must then go into the placement, rendering and lighting context to finalise the scene, even though there is actually not much time left to do all those things. But, there is a highly productive way to assemble a scene and work directly on the final image for any final look development, and that's where this tutorial comes in. We make it a priority to remove this inbalance of energy and time.

We will use Clarisse iFX as a core tool, which lets us work on the real deal without approximations and we will build a small scene structure. The asset management in Clarisse is pretty similar to a common OS file system. Afterwards we will dive into asset properties to activate subdivision surface functions. Furthermore we use the build-in scatterer functionality, where the positions are based on point clouds. Next in line is the material system, which will be used to colourise the assets. The most fascinating part of Clarisse is the way it works regarding the 3D layer structure. Our scene lies in a 3D layer, and via an implemented layering system we'll start the compositing, look development and lighting in the image view.

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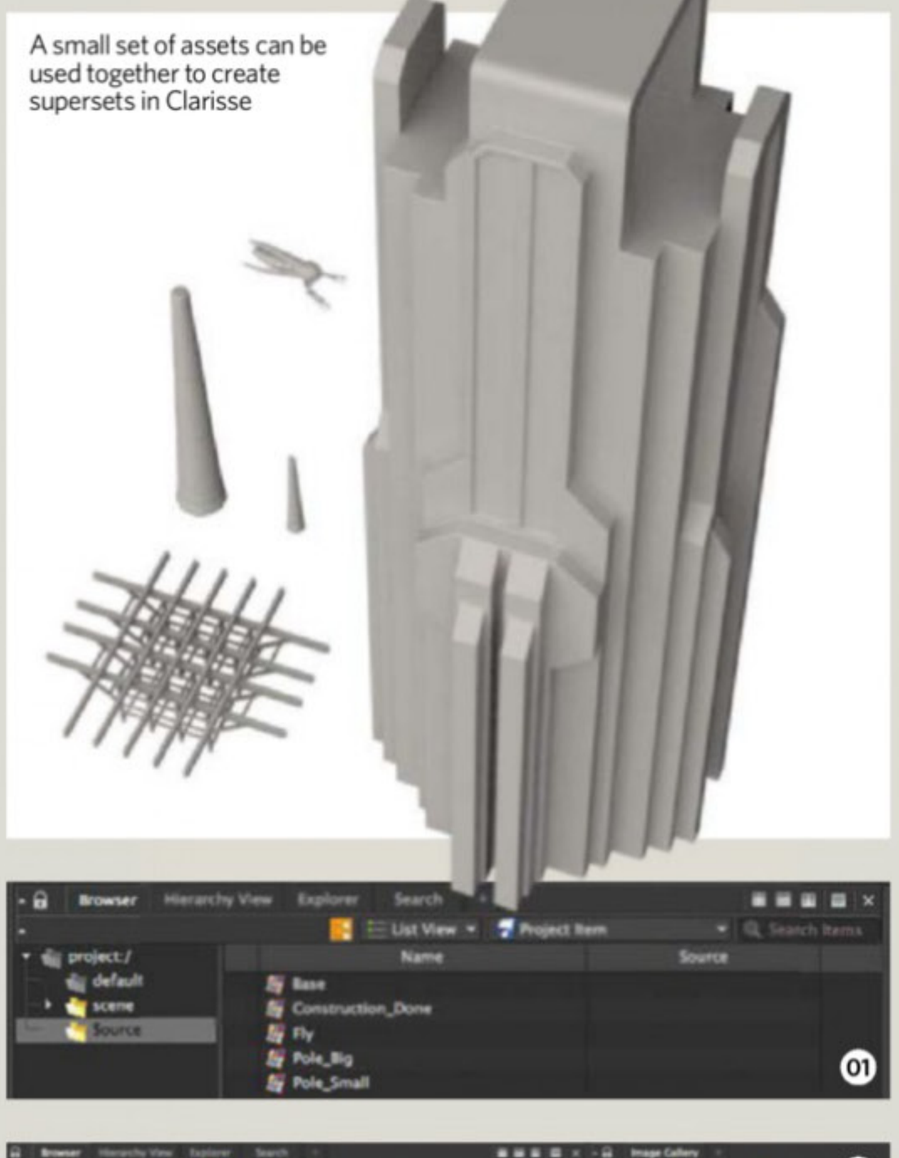
Don't spend too much time painting the details because it's more important to fill the scene – it needs a certain direction for the look to work

Collection of objects

In Clarisse, everything is an object from a programmer's point of view. That's the reason why you'll find a lot of objects in your Material's context folder after all shaders are done. Each node will be stored as an object outside of the Material Editor. If you want to create bigger shader networks separate from a material preset and you need a visibility option, just create a mate object and work on that as base material. There are cases where you don't need a material, eg decimating a point cloud via a procedural network.



A small set of assets can be used together to create supersets in Clarisse

01 Import source assets

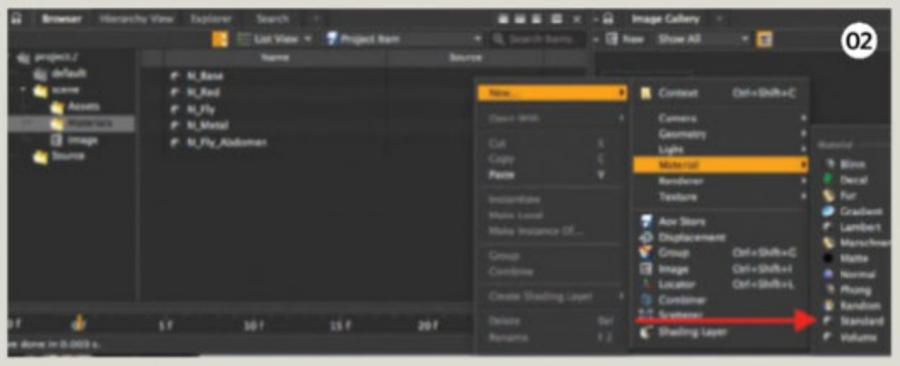
First, create a new context – Clarisse terminology for creating a folder. In the lower-left corner, the browser is open by default. Right-click on the project level and under New, select Context. Rename it, by pressing F2, to 'Source'. Now import the assets from the objects folder on FileSilo via File and Import. Once there click Geometry. Clarisse is context sensitive, which means that you see assets in the viewport that are in the currently active context. Change the visibility by dragging and dropping a special context to the upper-right corner of the 3D viewport in the context field.

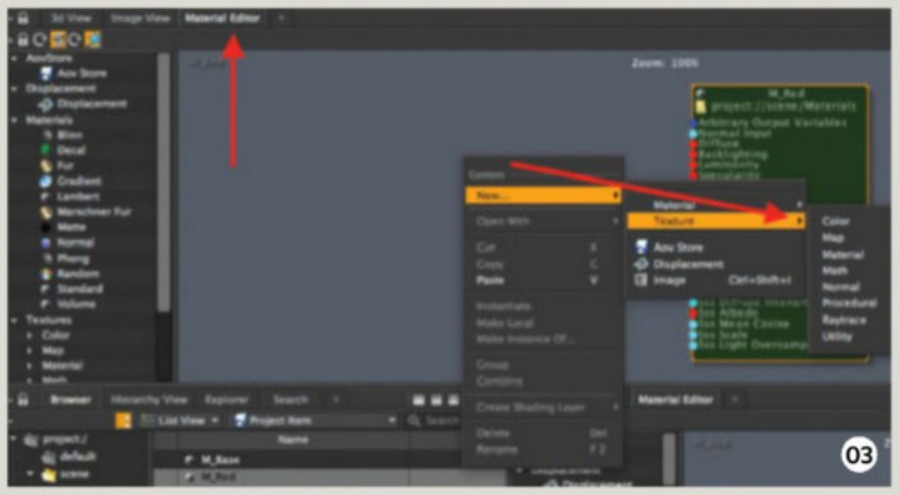
02 Prepare material base

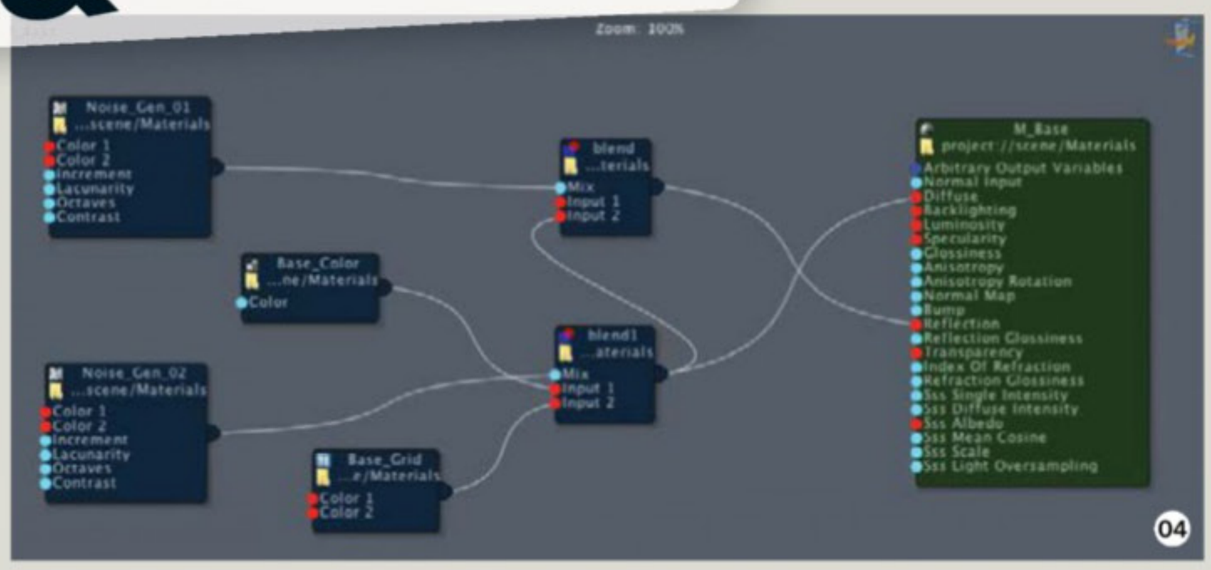
Next to the Source context we see a premade context called scene. That's our working context. Basically everything in there will be displayed in the image later on. Within this scene context we will now create a new context called 'Materials'. By right-clicking, go to New>Material. Once there, take the Standard Material and then create five of them: one for the base, one for the colour red, two for the fly and one for the metal. Now choose a proper naming convention starting with M_name. In the window to the right, click the plus and choose Material Editor.

03 Make it glow

We start with the easiest material to make – the red glow. You can start by selecting the M_Red material and jump into the Material Editor, which is now open on the right side. Clarisse offers the same material system as most 3D applications, as well as some additional advanced features for you to play around with. Inside of the Material Editor the big output node is visible. Just right-click in the empty space and then create a constant colour. Then go ahead and connect it with the Luminosity slot and choose an RGB value of 0.675, 0, 0. You can access the parameters in the Attribute Editor, which is by default located at the right side of the screen.







04 Set up primming

Now we work within the M_Base material. In total we need six more nodes in the Material Editor for the base material: two blend objects, two fractal objects, one constant colour and a grid object. Connect one fractal node with one blend mix input so that each blend node will be mixed by a different fractal. The upper blend output will then go to the Reflection slot. The lower blend node will then go to input two of the first blend node and to the Diffuse slot. The constant again goes into the first input of the second blend node and input two is for the grid node.

05 Finish for the prime coat

Both fractal noises and the grid have special attributes and one of them is the spatial projection method. It's important here that they use UV as a projection mode because buildings and antennas have a UV channel and a pattern. The first fractal noise needs a colour tweak for colour one. Use the values 0.78, 0.78 and 0.78. The second fractal node for colour one needs 0.52, 0.52 and 0.52 and colour two needs 0.22, 0.22 and 0.22. Colour one for the grid will be 0.169, 0.147 and 0.134. Last but not least, we need to change the constant. Use 0,463, 0.406 and 0.359 here. The grid must get a UV scale of four per cent three times.

06 Get textures for Clarisse

The metal construction does not only have a proper unwrap but also a diffuse texture which gives it the right colour. So it's time to move towards the M_Metal material. At first we import the diffuse texture and we do that by clicking File, and then under the submenu Texture choose Map File. Take the file T_Metal_D.tga from the textures folder on FileSilo. The texture is now available as a new object in the material context. Just drag and drop the texture object into the Material Editor and connect it to the Diffuse slot.

07 Paint finish for the flies

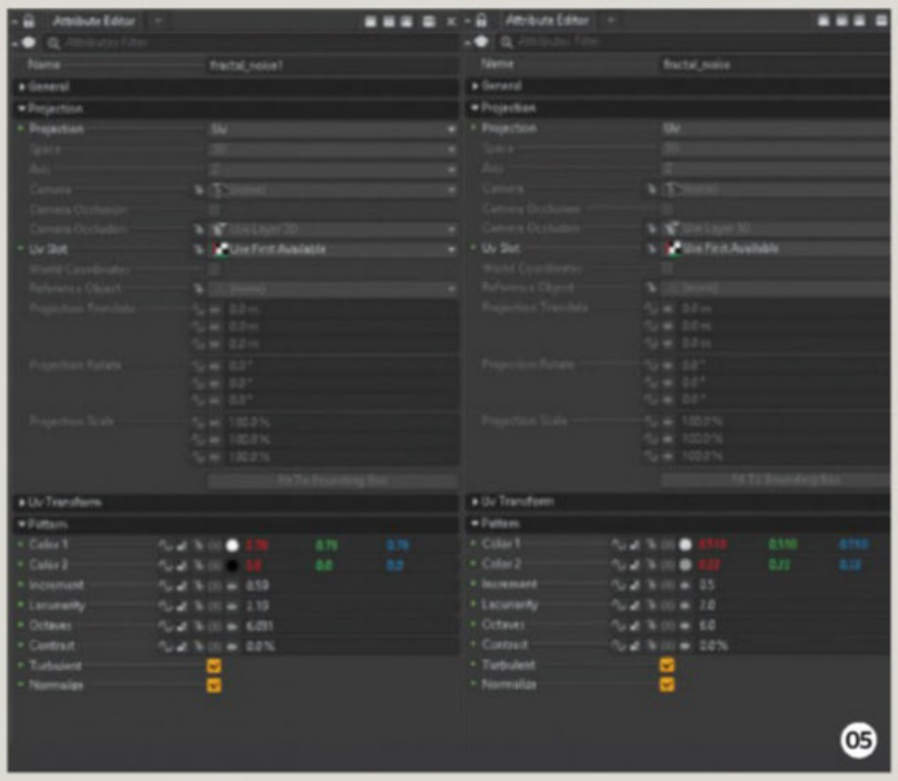
The material M_Fly needs, in total, two blend nodes, one cellular and one fractal noise followed by a constant, a gradient and an incidence node (or in Clarisse terminology – an object). We connect the cellular noise with the mix input of the first blend node. Input two must be linked to the constant colour. Now, proceed to plugging the blend node into the Diffuse slot. The fractal noise needs to be connected to the mix input of the second blend node. Incidence must go to the gradient and the gradient must then go into input two of the second blend node. Now just connect this blend node with the Reflection slot.

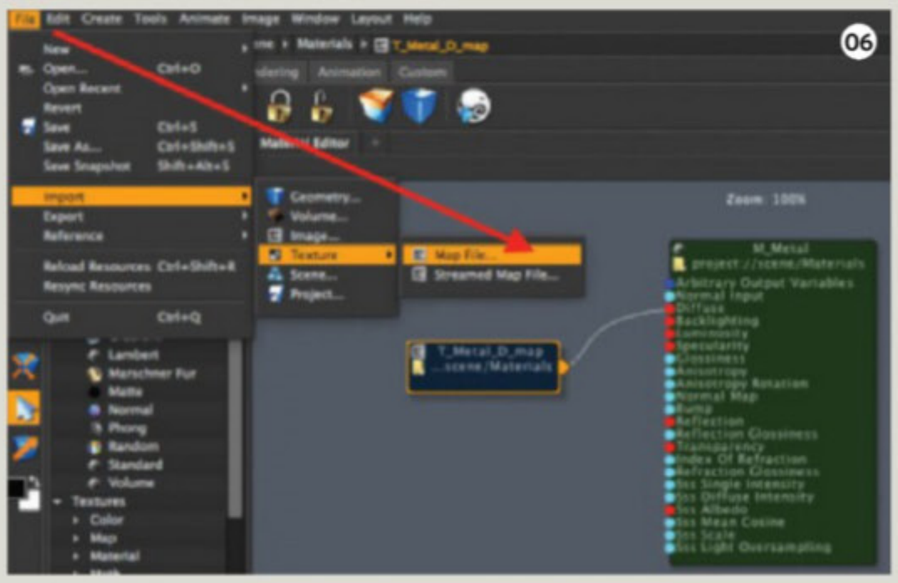
08 Adjust attributes to get the desired look

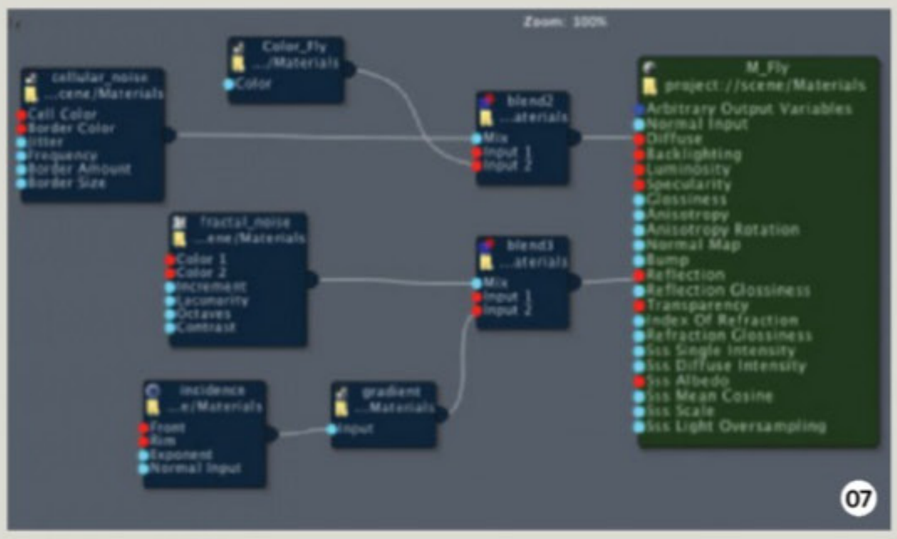
The constant colour needs the values 0.125, 0.114 and 0.106. Both noises must use the spatial projection method of spherical. Evaluated will be the texture in 3D space and the projection axis should be Z. Now go to the incidence node and once on there, use an exponent of 450. The gradient must go from black to white. Add the corresponding colours in the Attribute Editor. Colour one, at the fractal noise, needs 0.576 put in three times. Colour two must then be set as 0.325 three times. Back to the cellular node and cell colour needs to be set as 0.239 three times and border colour set as 0.647 three times too.

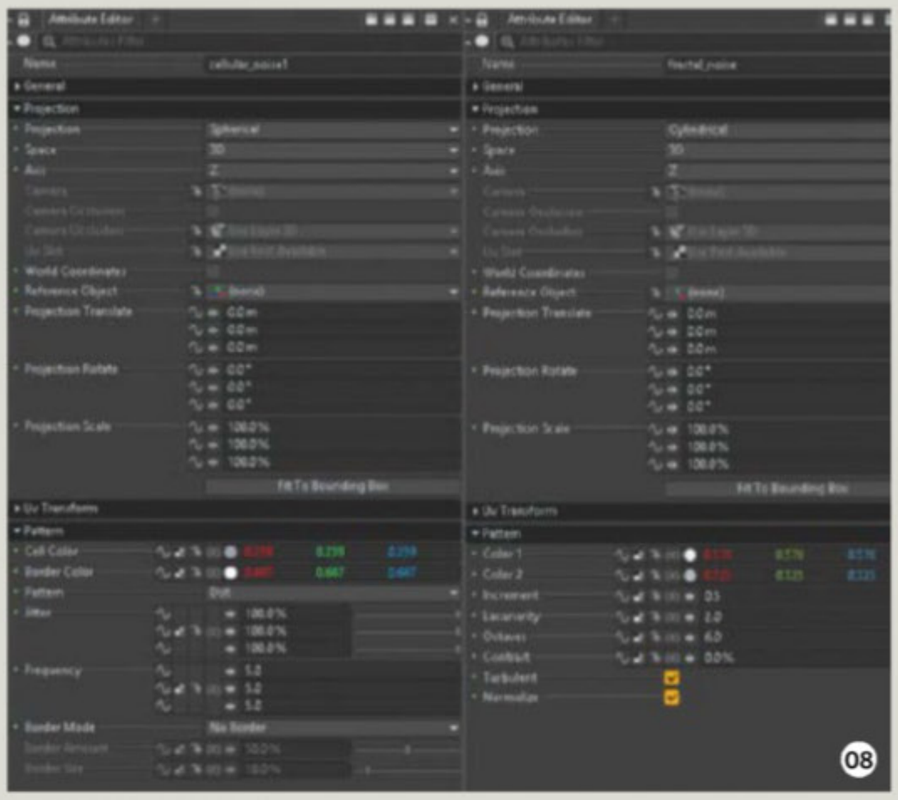
Fast scene assembly using combiners

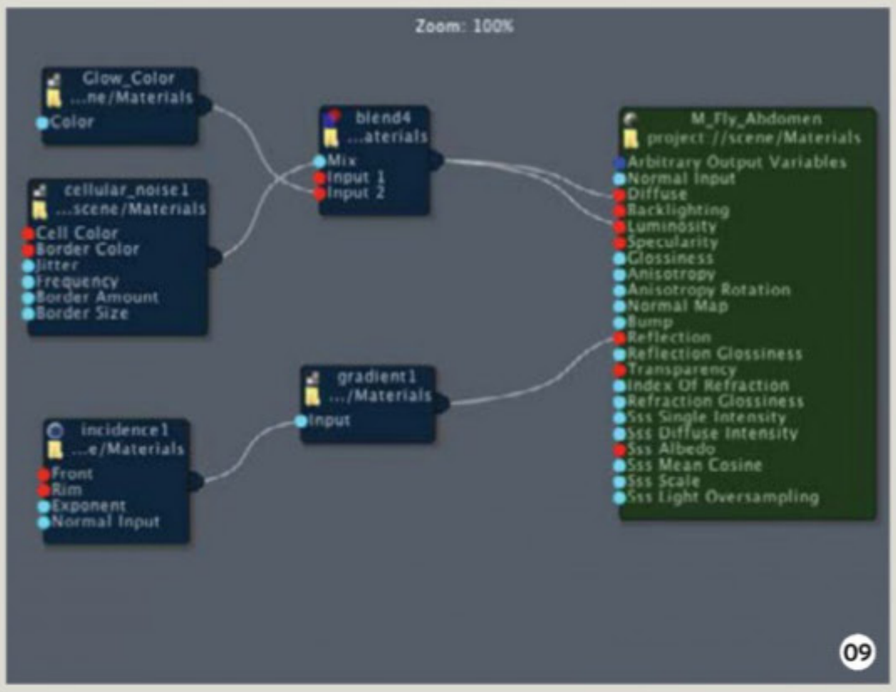
Basically all the puzzle pieces are now in place, so it's time to combine them in the correct order so that we can work productively. Instantiate assets from the source folder, apply the materials via the material linker functionality and combine the assets together. A combiner is a really powerful tool in Clarisse – it works like a list of references but it's a separate object and can act like one too. This enables users to create supersets in their shots and change them quickly through the dynamic referencing functionality. Afterwards we place them in the level on a reasonable spot for the scattering.

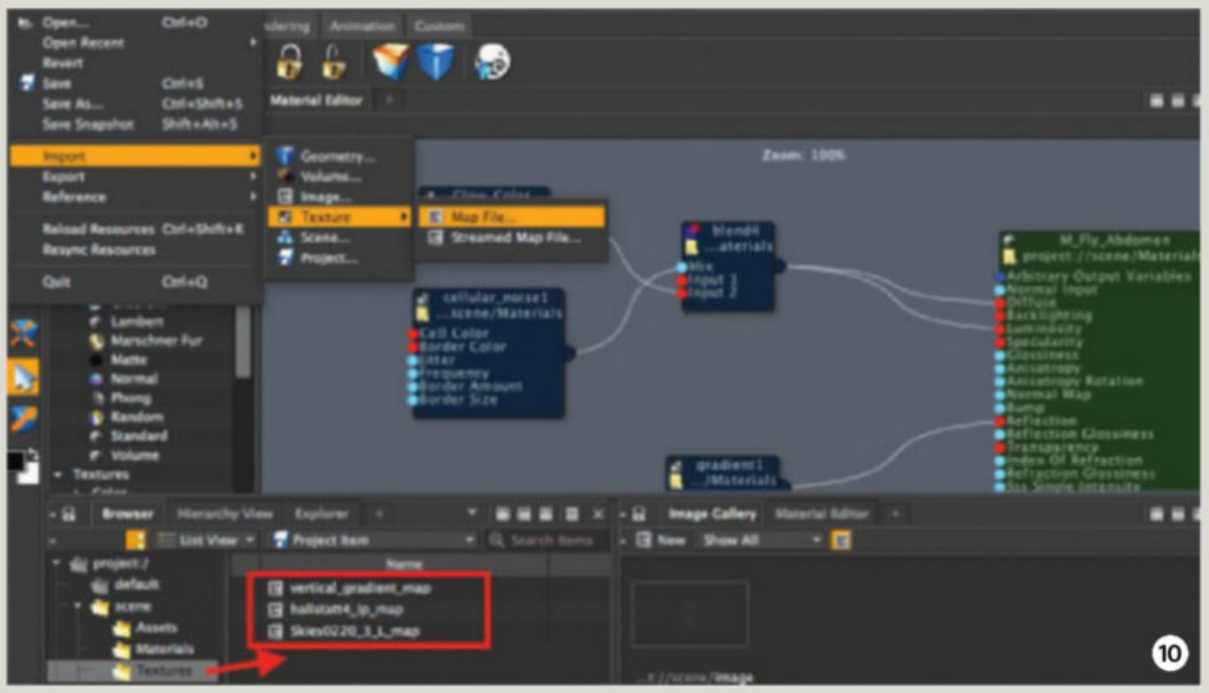


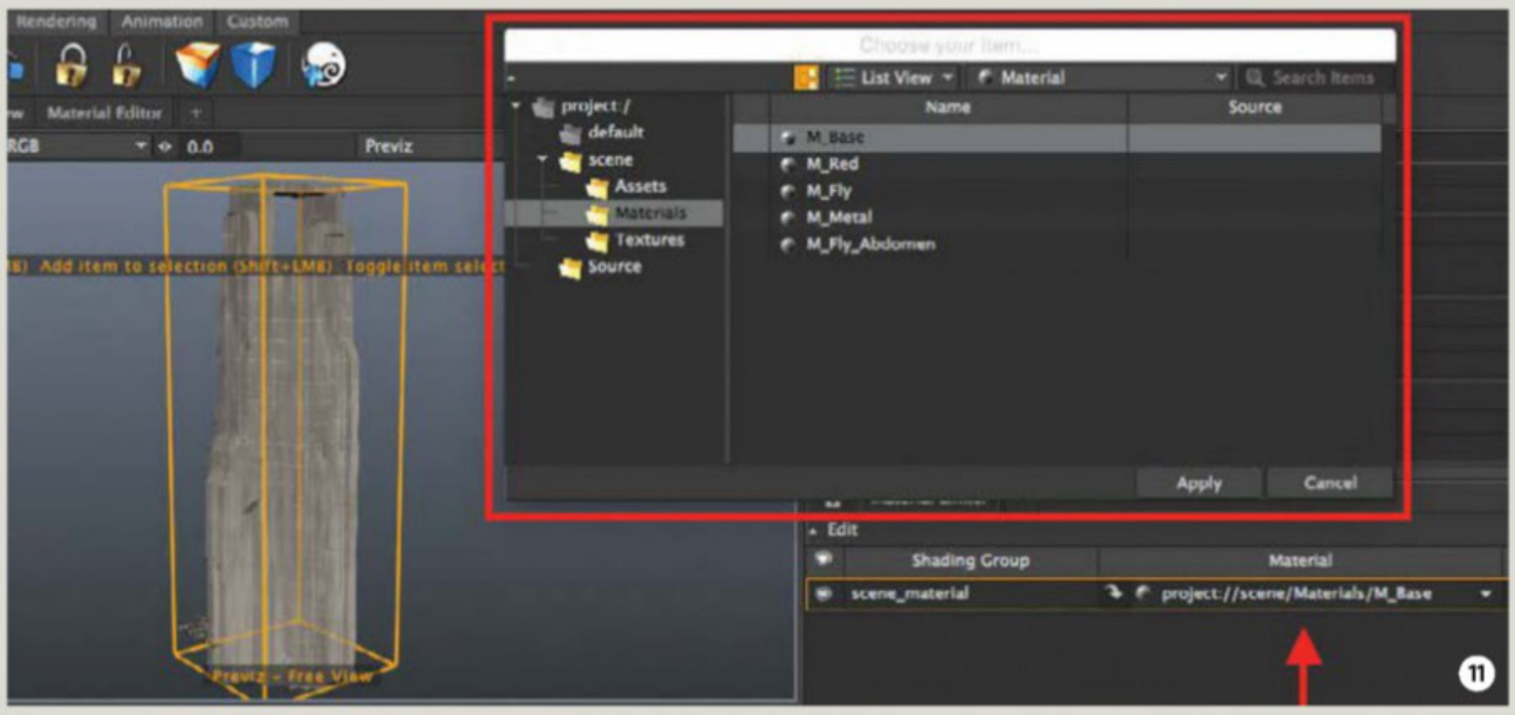


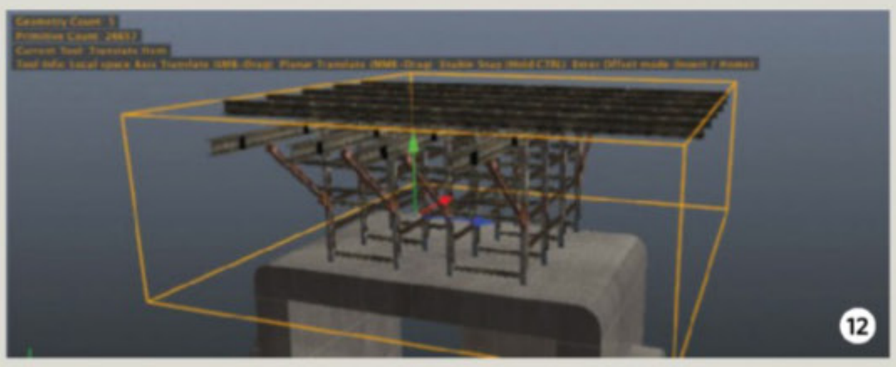


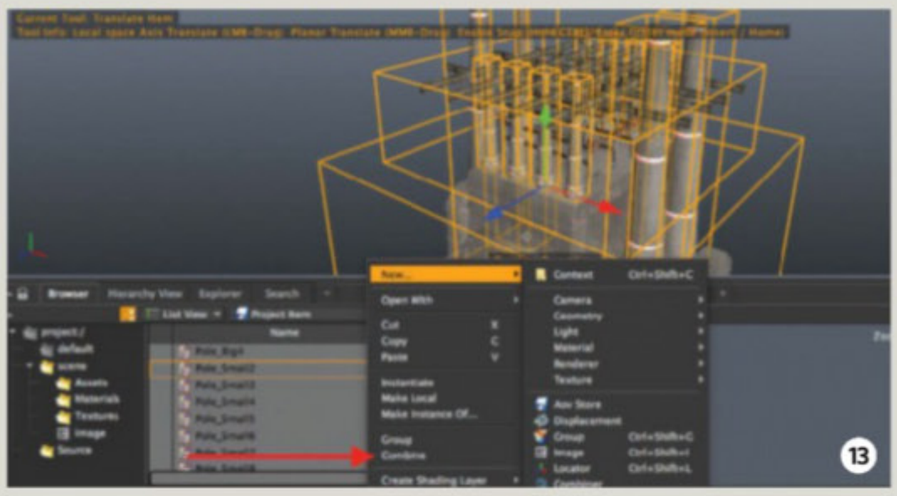












All actors in position

There are many placing assets methods in Clarisse. We will cover the classic way for scattering, where we have made use of two planes that are created inside Clarisse. These act as the base for a point cloud and this point cloud then defines the spots where we scatter the flies. Both objects, point cloud and scatterer, have plenty of attributes to create variations such as scaling and transition variations.

09 Final tweaks

The M_Fly_Abdomen material is shorter in terms of nodes. We need a constant colour, a blend node and a cellular noise for Diffuse and Luminosity. For the Reflection we use just a gradient and incidence node, so let's connect the incidence node to the gradient and the gradient to the Reflection slot. Exponent is the same as before at 450. The gradient must also go from black to white and the blend node must be linked to the Diffuse and Luminosity slot. Then, constant colour with the values 0.361, 0.048 and 0.048 goes into input two. The blend mix then needs to be connected with the cellular noise. Projection mode is also spherical in the 3D space and z axis.

10 Composite textures

To finalise the import and material preparation track, it's time to import the last textures – these will be used as an overlay and background for the final image. Create another context under the scene context called Textures. Then, import the sky texture called Skies0220_3_L.jpg from the CGTextures folder into it. After that, import the vertical_gradient.tga from the Textures folder as well as the hallstatt4_lp.hdr file from the HDRi folder for the environment light later on. You can do the import process by going to File>Import and under Texture flick the Map File function.

11 Assign materials

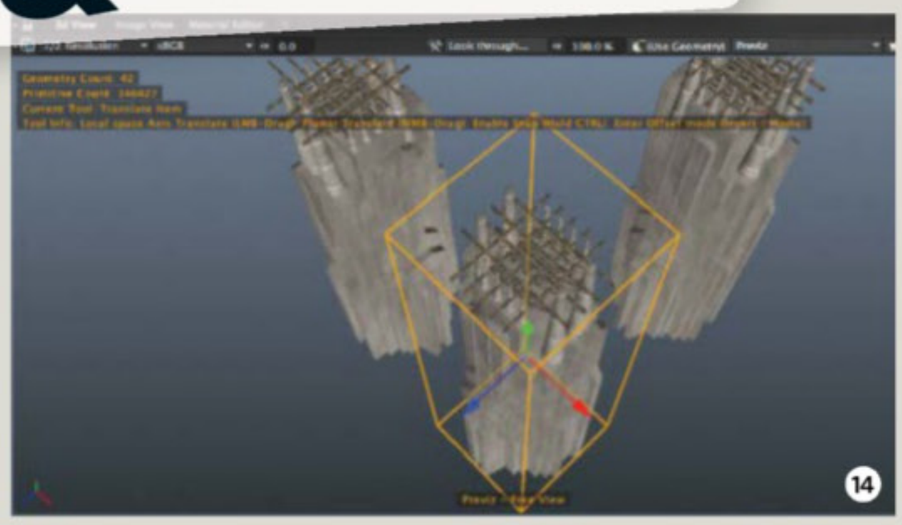
Move to the Source folder and select all assets. Access the instantiate function, which creates instances, with a right-click. Now select all instances – assets with a small I – and drag them to a newly created assets context within the scene context. Select each asset by asset and assign the corresponding material via the material linker – it lies directly under the Attribute Editor. Under the Material section press the arrow and select the Material from the Material context. This material linker is really productive, especially if you have millions of assets in the scene and you want to assign materials to them.

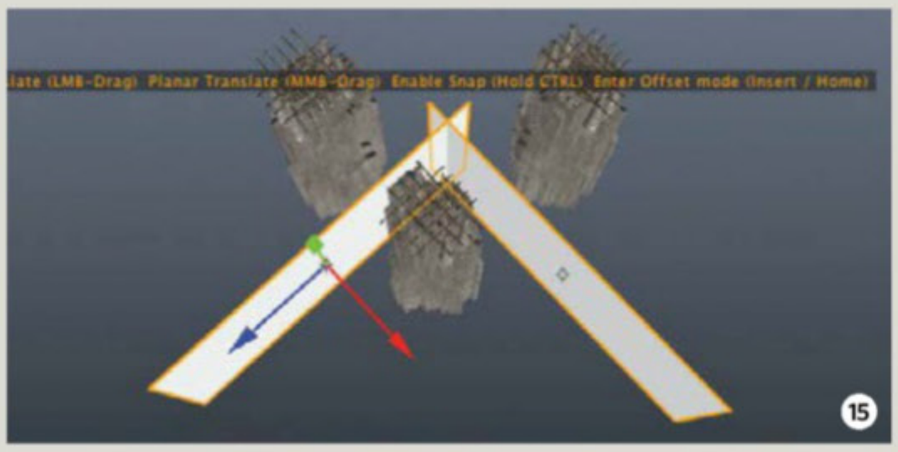
12 Put the roof on

The controls for placing the metal construction on top of the skyscraper is very similar to how it should be done in Maya. On the left-hand side, next to the 3D viewport, are the manipulators. We must drag and drop the scene context to the upper-left corner of the 3D viewport to be able to see what we do. Next to it is the visualisation method for the 3D scene – the raytracer. Choose Previz and increase sampling quality to 100 per cent.

13 Finalise the building

There are two poles available – pick both and move them to the top of the buildings. Set them to local mode and remove the instantiate flag because we will copy and paste them around the top. Four big ones on the lower-top and eight of the small poles will cover the metal beams. Now select building, metal construction and all of the antennas. Right-click them in the browser and combine them. Select everything now except the combiner and disable the display visible flag in the Attribute Editor.



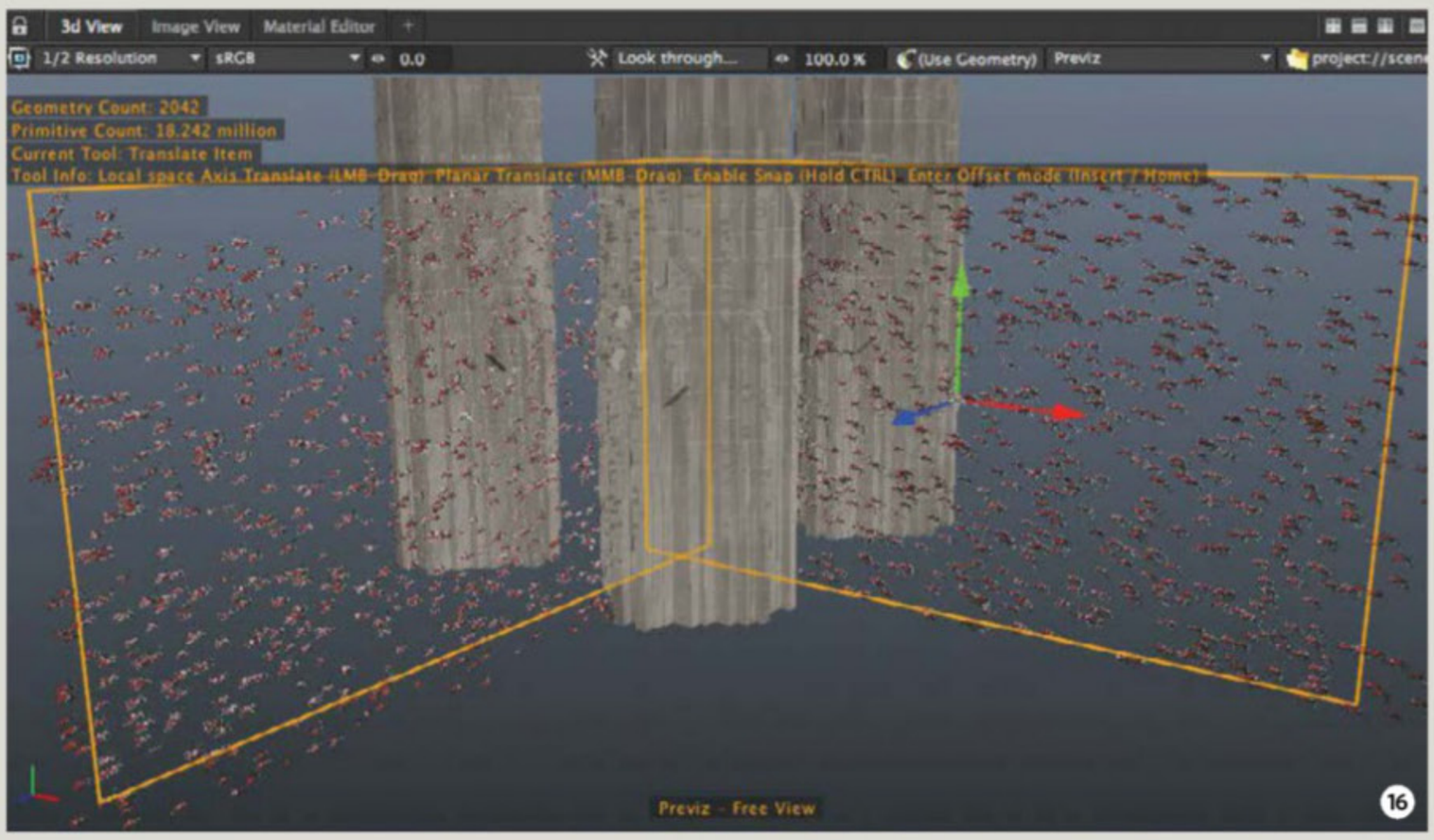


14 Add two skyscrapers and a turntable

Let's start with two copies of the skyscraper combiner via copy and paste so we now have three buildings. The initial skyscraper has the translate attributes of 0m, 180m and 0m. Based on a perspective from a top view, the left building has the translate attributes of -158m, 180m and 0m plus a y rotation of -90 degrees. The third building on the right-hand side has the translate attributes 0m, 180m and -185m. If there are still some base objects visible, then select all initial assets from Step 13 and add all the flags on the visibility drop-down menu.

15 Make the scatterer base

Now create another context in the asset context with the name 'scattering'. Within this new context, create two polygrids via right-click and New – under Geometry is the polygrid function. Scale them so big that they can easily be used to wrap the buildings. Move them down a bit and let them cross a tiny bit to the right after the first building. Now it's time to create two scatterer objects, two point clouds and we need to copy the fly over to this context. Again we must use the make local function for the fly.

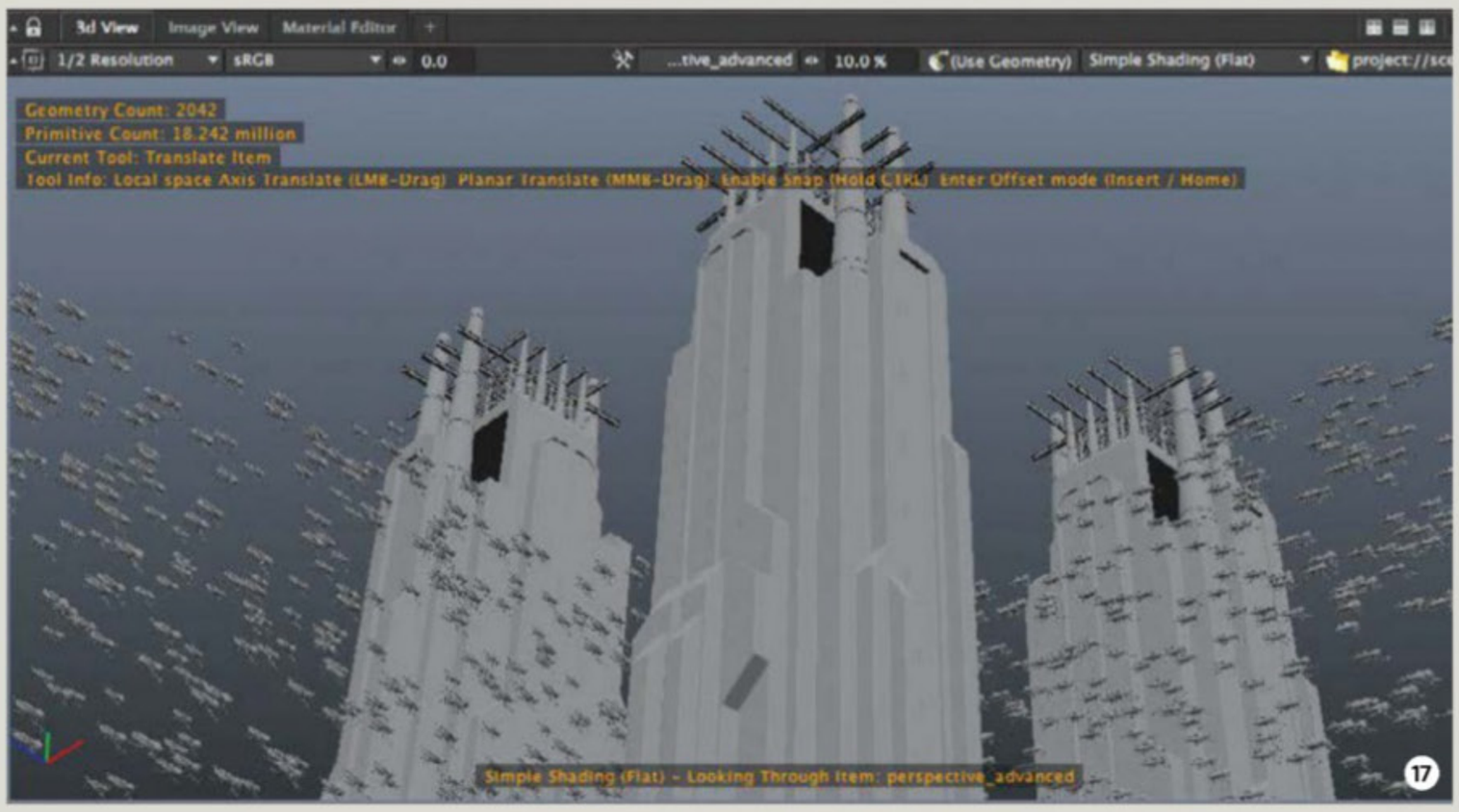


16 Double the population and add the polygrid

Select the first point cloud and jump to the attributes – under Kinematics is the field parent which needs the first polygrid. That means the point cloud has the same transformations as the grid. Now, under scattering, we will need to add the first polygrid under geometry. The value for density will be 1000. Now for the first scatterer: under Scattering we will add the first point cloud as geometry support and put in 100 per cent as supported normals value. In the field geometry we add the fly. When you are on the scatter scale variance, add in 25 per cent three times for all boxes. Scatter rotation on Y must be 90 degrees as well as for the scatter position on X 15m, Z 10m and position variance on X 15m.

17 Clean up efforts and place intruders

You will now need to do the same step for the second set of point clouds and scatterers. The second scatterer just needs the scatter rotation set as 0 degrees three times on XYZ on the scatter rotation order. Select the fly now and scale it down to 40 per cent. At this stage of the scene, we can delete the default light and the default camera under the scene context. To replace these, we will create a perspective advanced camera. We place it on the position 370m, -176m and 366m for XYZ and rotate it with the rotation order ZYX (49 degrees, 35 degrees and -31,5 degrees).

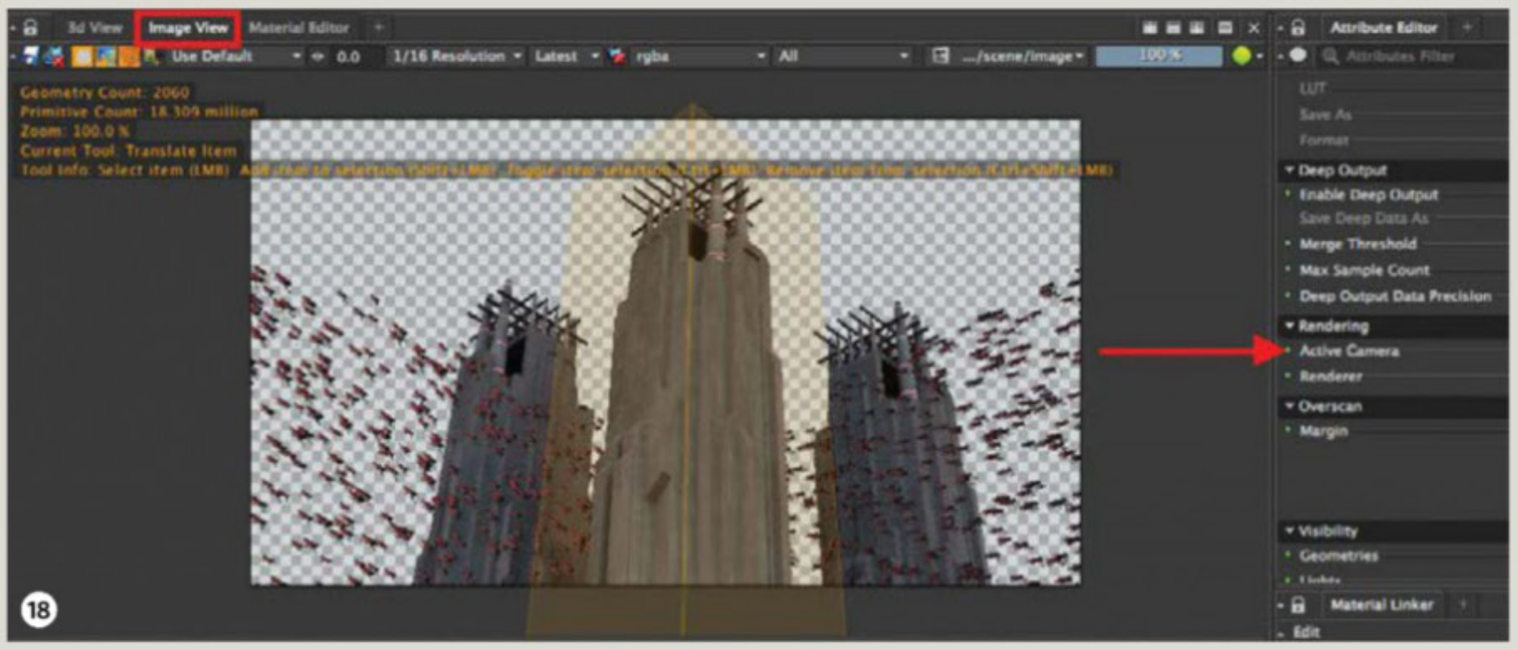


Light for the two protagonists

In this last part, it's time to add some lights. At the beginning we made use of the environment light. By adding a HDR texture we light the whole scene at once and Monte Carlo GI will give us some really good results afterwards. We add two more copies of the flies and position them by hand. Each one will get a spotlight to get into the right light. The end phase will cover the compositing and that's when the user can play around and modify the scene directly when they're on the final image with room to breathe.

18 Administer the environment light

Now, we simply add an environment light via the tool menu. Right-click to go to New>Light>Environment light. Back in the Attribute Editor we must add the HDR texture into the Texture field under Lighting. If we scroll down we will immediately see the sampling area where we increase the quality to 10. To test the setup, switch to the Image View. Before the rendering starts we need to add the new camera to the 3D layer. Go to the Browser, click the plus next to the image object and select the background layer. In the attributes, under Rendering, add the cam under Active Camera.

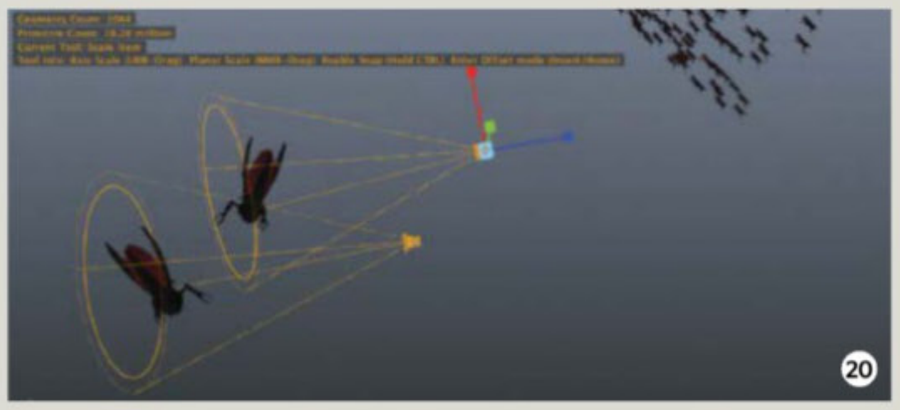


19 Position the flies

We are almost ready to play around now. Create a new context first within the scene context called 'protagonists', and copy the fly object from the assets context over and make it local again. Then switch the view from the 3D view to our image view, and start playing around with the manipulators until the position of the flies is where we want them to be. Clarisse is working with a high-end evaluation engine, which means that the rendering process does not work on rebuilding everything – only on what really needs to be changed.

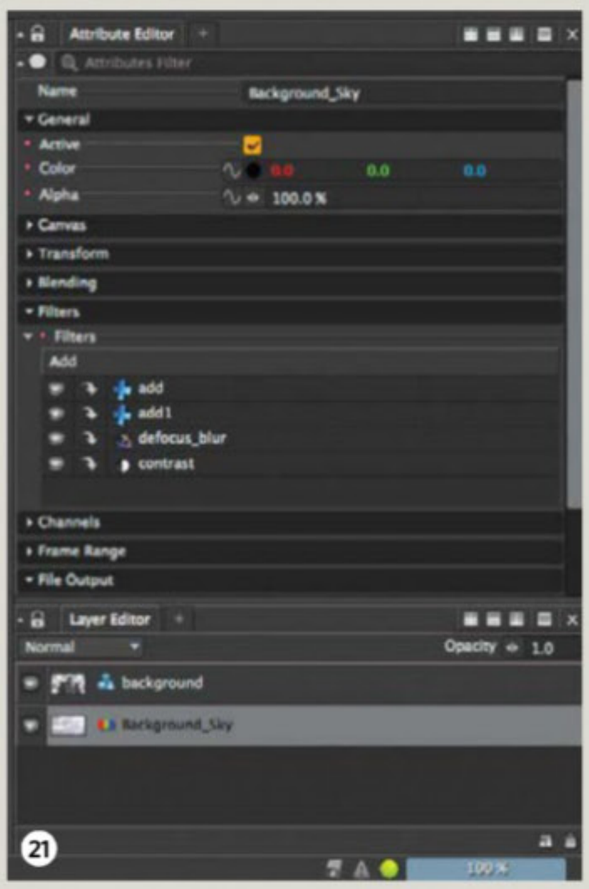
20 Final light touches

Some more little light touches are necessary but that's easy to do. Now we jump back to the root of our scene context. At first we add a Monte Carlo GI object and increase the sampling quality in the Attribute Editor to 6. Subsequently we must add two spotlights and bring them in place for the flies. We do that in the 3D view as we have a better view of the light cone over there. If the light appears too small just scale it up, but make sure you increase the intensity as well to something around 1000 or more. Additionally, increase the cone angle.



21 Integrate a sky background layer

What's left is the sky background behind the buildings. Instead of using traditional techniques we will use a simpler approach. Let's add a 2D layer in the Layer Editor and move it below the background layer and set it to black. Now go into the Attribute Editor>Filters and add an Add filter. You can dive into it via clicking the arrow. Under Color we press the texture button and add the sky's texture. A second Add filter will give us the tint. Use 0.227, 0.178 and 0.168 as the colour values. Afterwards, add a defocus blur with a 10 pixel radius plus a contrast filter at 25 per cent.

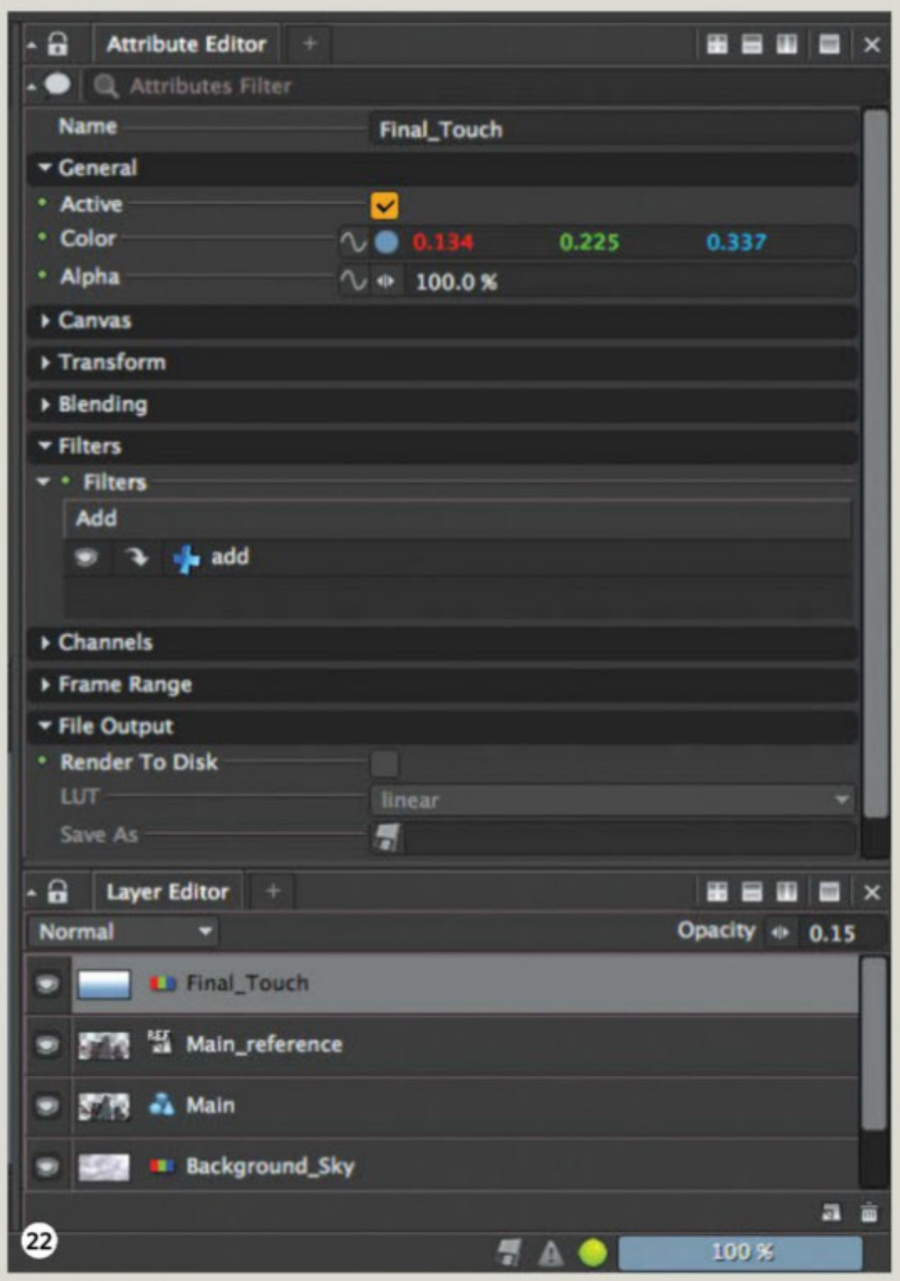


Lense diffusion as final touch

In many shots you'll see some sort of lense diffusion effect with a bit of glow integrated to reduce that sharpness of a picture. There is an easy way to re-create this effect in Clarisse iFX. In the Layer Editor, simply right-click on the 3D layer that contains all the assets and make a reference of it. Now go into the Filters tab in the Attribute Editor and add a gaussian blur function with a value of eight pixels. Finally, reduce the reference layer's opacity to 15.

22 Add global tint

To add a more dramatic feeling to the scene and bring in some colours, it's time to add another 2D layer on top of all layers. Colourise it with 0.134, 0.225 and 0.337, then go to Filters and add an Add function. Next, click the Texture icon and then choose the vertical gradient texture. Then all you have to do is to change the Opacity value over the layers, which is in the upper-right corner, and reduce it to 0.08.



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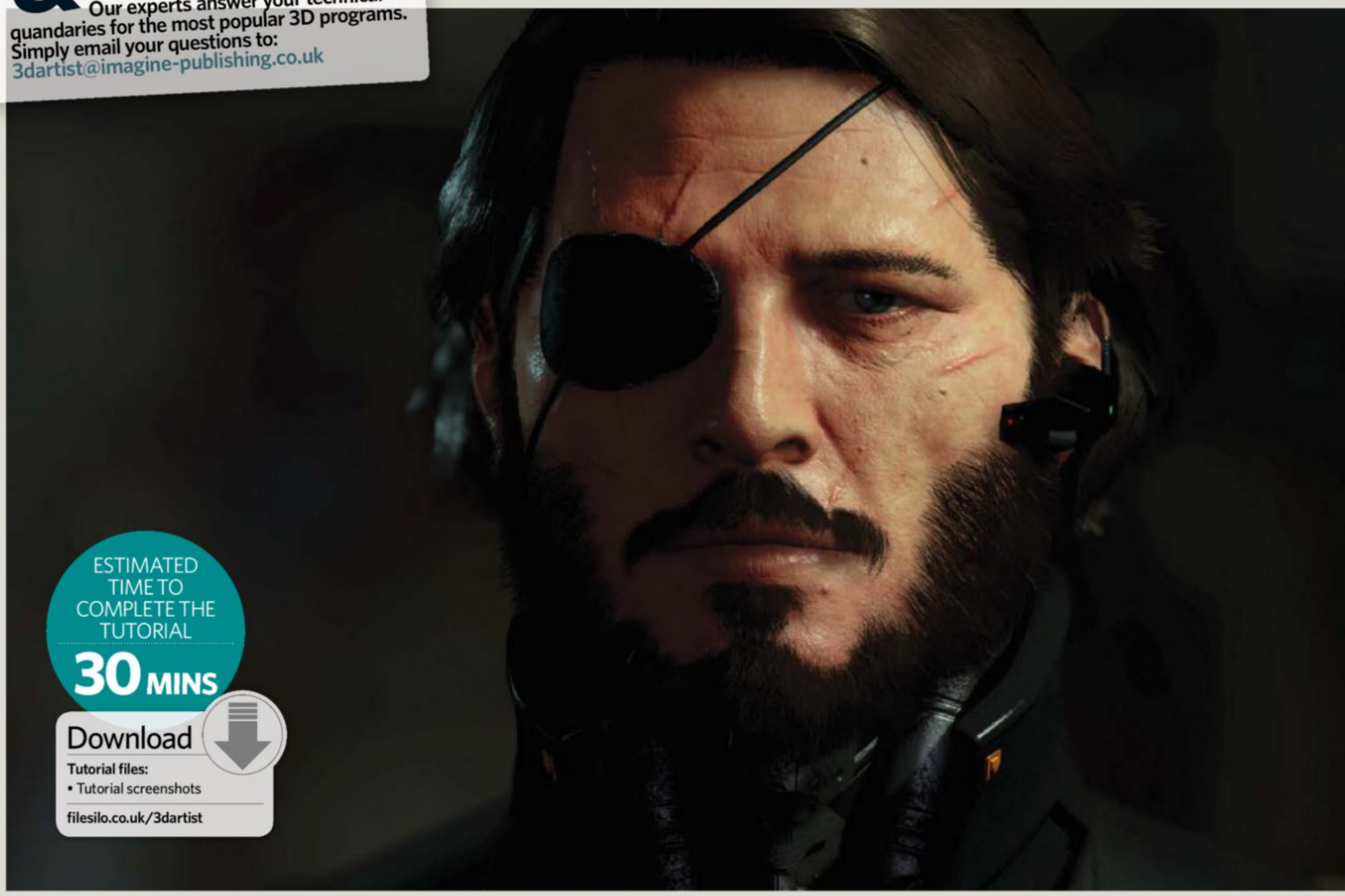

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Create realistic scarring

“How do I sculpt believable scars onto my real-time character using ZBrush and Maya?”

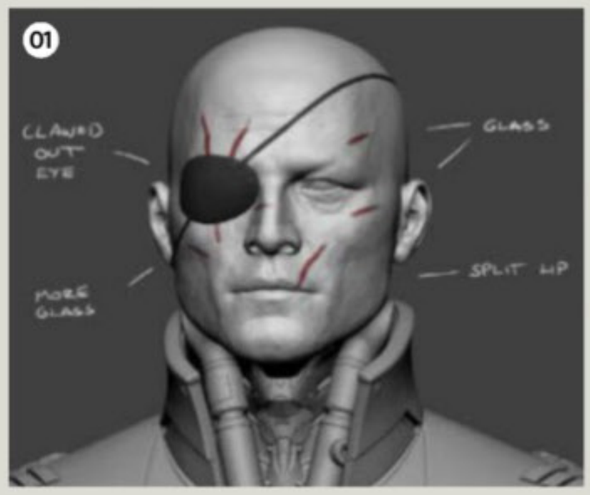
Scars are often used as a storytelling device in most character designs. They get you to question everything about the character. What events led up to them getting that gruesome thing? What did they do to deserve it? What personality might they have? So it is important to think about what you are doing and if your character even needs scars in the first place. As we are going for realism we will need to make sure we can answer these questions, and more, to add depth and believability to our character. We are going to make our scars using ZBrush, Maya and Marmoset’s Toolbag 2.

Scars can originate from many different injuries or birth defects, so we need to make sure we know what we are after before beginning. In this tutorial we will concentrate on concave and convex scarring techniques, which can be applicable to most tissue scarring including burns, birthmarks and stitching. The techniques are very simple and will take no time at all.

We will start by doing a bit of research and considering their placement on the model. This is probably the most crucial part of the tutorial – if the placement is not correct it can ruin the entire realism of the character. The scars will have a large impact on the overall design so we will need to be careful and be very selective of their placement.

Then we will move onto sculpting. We can add scars at any time during this phase. If it’s smaller scarring, add them close to the end so that you are not distracted from the forms that you are trying to find in the face whilst sculpting. But if they are significant scars (hero elements) that are important to the design, then it may be important to get them in early and then work around them. Every character is different so you will need to use your best judgement.

Next we will prep them for texturing before taking the model into Toolbag 2. This is where we will be able to view our results in real-time and allow for quick iterations when needed. Let’s begin!



01 Decide on the scar placement and position

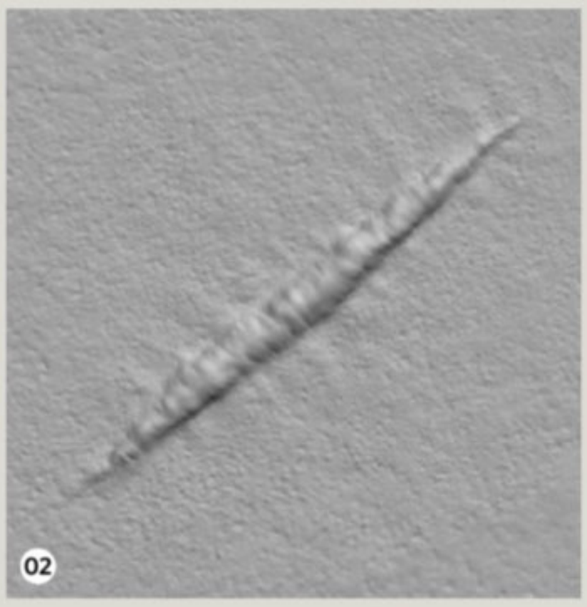
The actual placement of your scars will play a large part in the character's believability and will impact your design considerably. First thing to do is to take a few minutes and decide where you want to place your scars, also why they are there, and how they were made. This will all impact the type of scarring you need to replicate, help add depth and stability to your character, and minimise random placement as much as possible. For this character, we wanted to accentuate the scarring stereotype so we placed many scars all over his face.

02 Sculpt convex scarring

Now that we've decided on what scars we want, we can start sculpting them in. For the convex scarring, pull the healing tissue out by using a quick stroke with the Standard brush. Then by using the Inflate brush, we can add some swelling, which will add to the fleshy feel. If you have the resolution you can also add a few tension creases with the Dam Standard brush on a low intensity. We can also add some surface detailing with a Spray brush and small Alpha.

03 Sculpt concave scarring

For the concave scars that cut into the skin we simply carve into the skin with either a Standard or a Dam Standard brush. Scars generally do not heal straight so try to add a touch of misdirection here and there. You also often get a bit of pull on the tissue surrounding these, so using the Inflate brush we can add some subtle distortion. Now we can add surface detailing to this in the same manner as the previous step. Adding this extra detail will really help us when it comes to the eventual baking process.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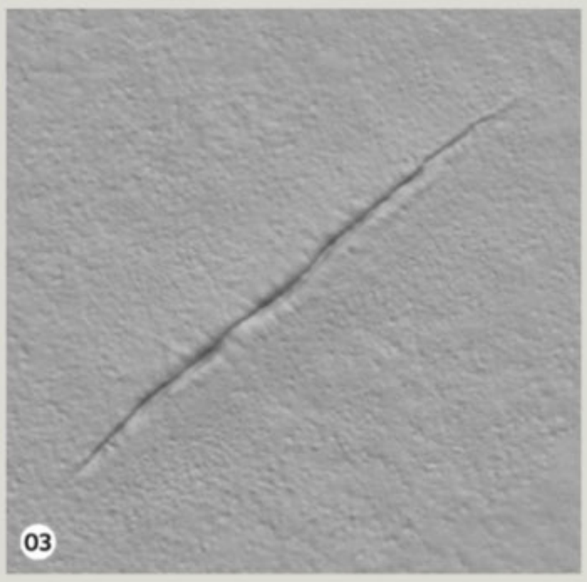
03

Research is key

Make sure to do plenty of research into whatever you are doing as an artist. It helps re-enforce the realism and will ensure better results than just working from inside your head. Scars can be a bit gruesome sometimes so just be wary when searching online. With skin we are lucky as we all have it, so make sure to observe yourself in the mirror and stare at others to see how different peoples' skin reacts to light. Watching movies is a good way of observing skin too, making replicating it easier.

04

05

04 Polypaint the skin

When we are happy with our sculpt and we are ready for texturing we can start Polypainting a first pass for our Albedo/ Diffuse maps. This we will use as a starting point for our textures. So we first start by Polypainting the skin with a Spray brush, adding in subtle hues here and there and skin blemishes. Now we need a nice fleshy colour for the scars. We can then bake out the Polypaint information and start refining our textures in our painting software.

05 Create textures

Making believable real-time skin in Toolbag 2 is very easy due to the supplied skin shader. We will need a Normal map, Albedo map, Gloss map, Subdermis map and a weight map to get the results that we want for our character. Marmoset's website has a fantastic video that can explain working with their Skin Shader and all the little tricks used in creating realistic skin. When creating realistic skin, it is important to work from reference and try to replicate the results the best you can. Lighting will also play a huge part in how your skin shader reacts.

06 Make the scars pop

Now that we have a nice skin shader, we can start tweaking the maps to make our scars pop. Scar tissue is usually a lot smoother than standard skin, so to simulate this we can edit our Gloss map by making the scar tissue a touch brighter. The next thing we do is tweak our Subdermis map by using a deep red on the scar tissue to give a more translucent and fleshy feel to them. You can also add the scars to your weight map to enhance the translucency effect.

06

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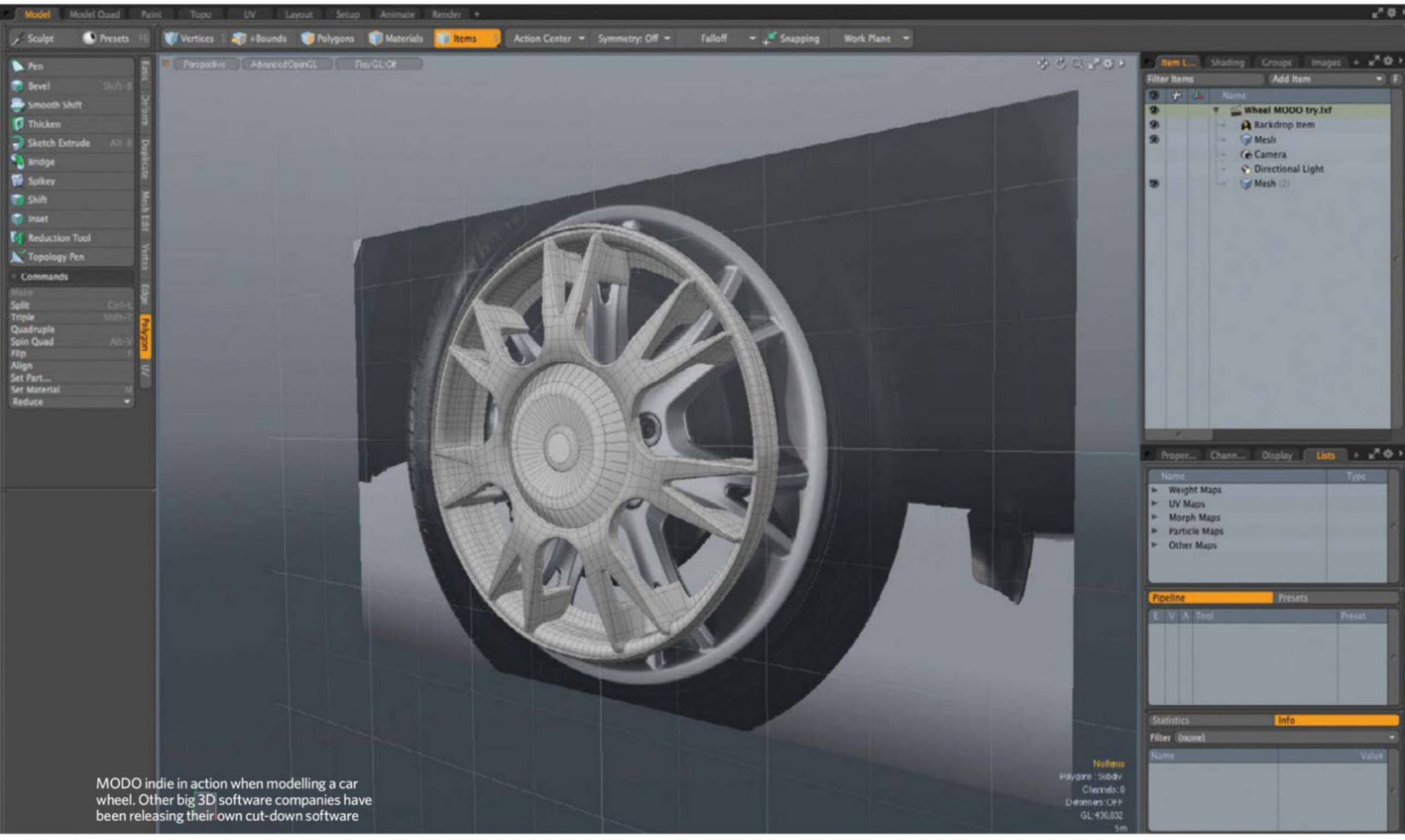


MODO indie in action when modelling a car wheel. Other big 3D software companies have been releasing their own cut-down software

MODO indie

Discover the potential of modelling, animating, rendering, and dynamics with the power of MODO for less than £11 a month

REVIEW BY **Larissa Mori,** 3D Artist magazine

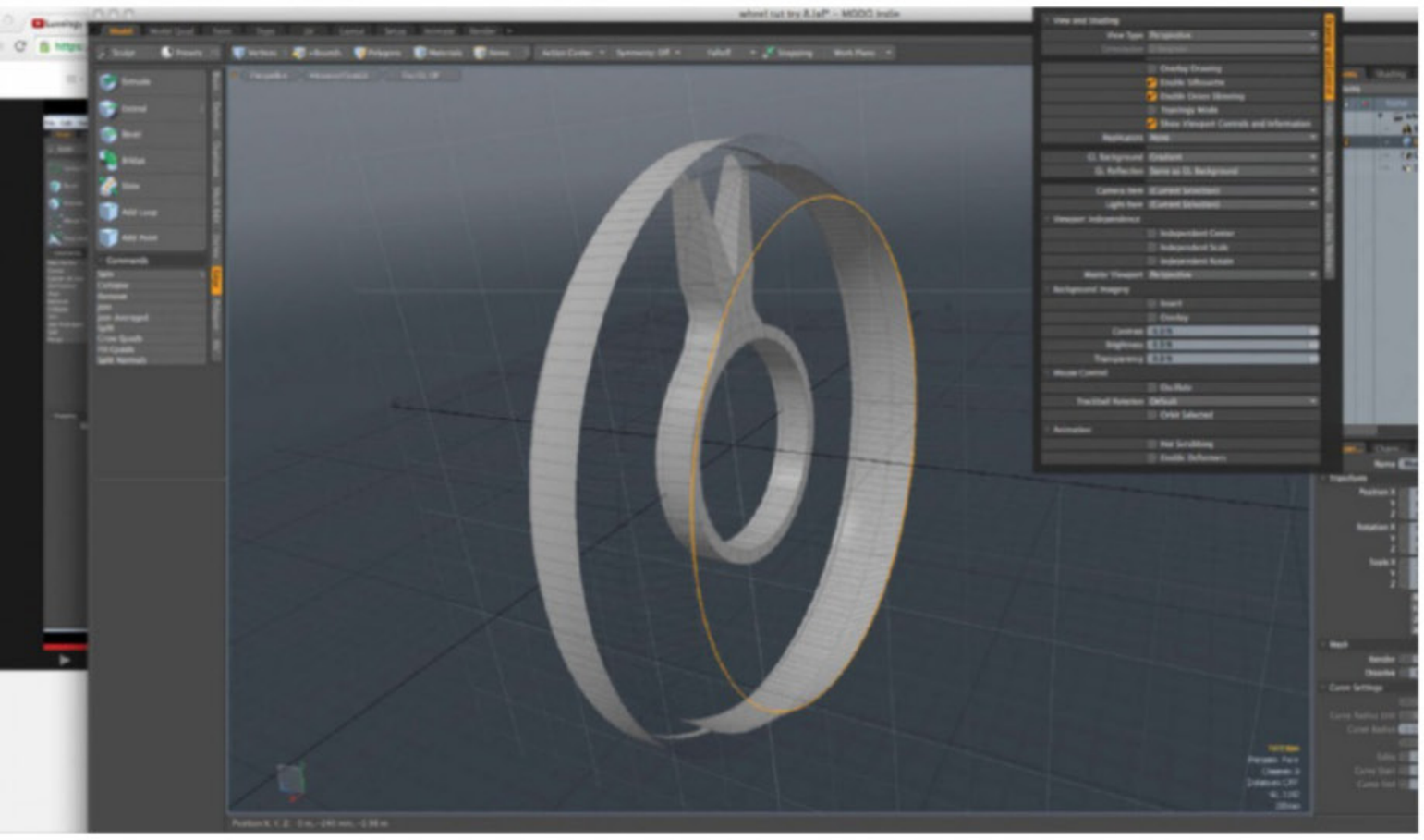
Back in 2013, The Foundry took a big step towards a new market with MODO Steam Edition: a cut-down version of the company's 3D modelling, animation, sculpting, effects, and rendering package specifically aimed towards modders and hobbyists on Steam. MODO SE, however, had some pretty severe limitations – things like dynamics, animation and rendering were not supported and there was a 7,000 polygon limit on exporting geometry. The licence only permitted for it to be used commercially to create assets sold via the Steam store. It was a modding tool and not to be used to make complete games or films.

December 2014 definitely brought an early Christmas present to MODO SE users though. The Foundry had released the new MODO indie, and anyone who had previously purchased the MODO Steam Edition from the Steam storefront would receive an upgrade for free.

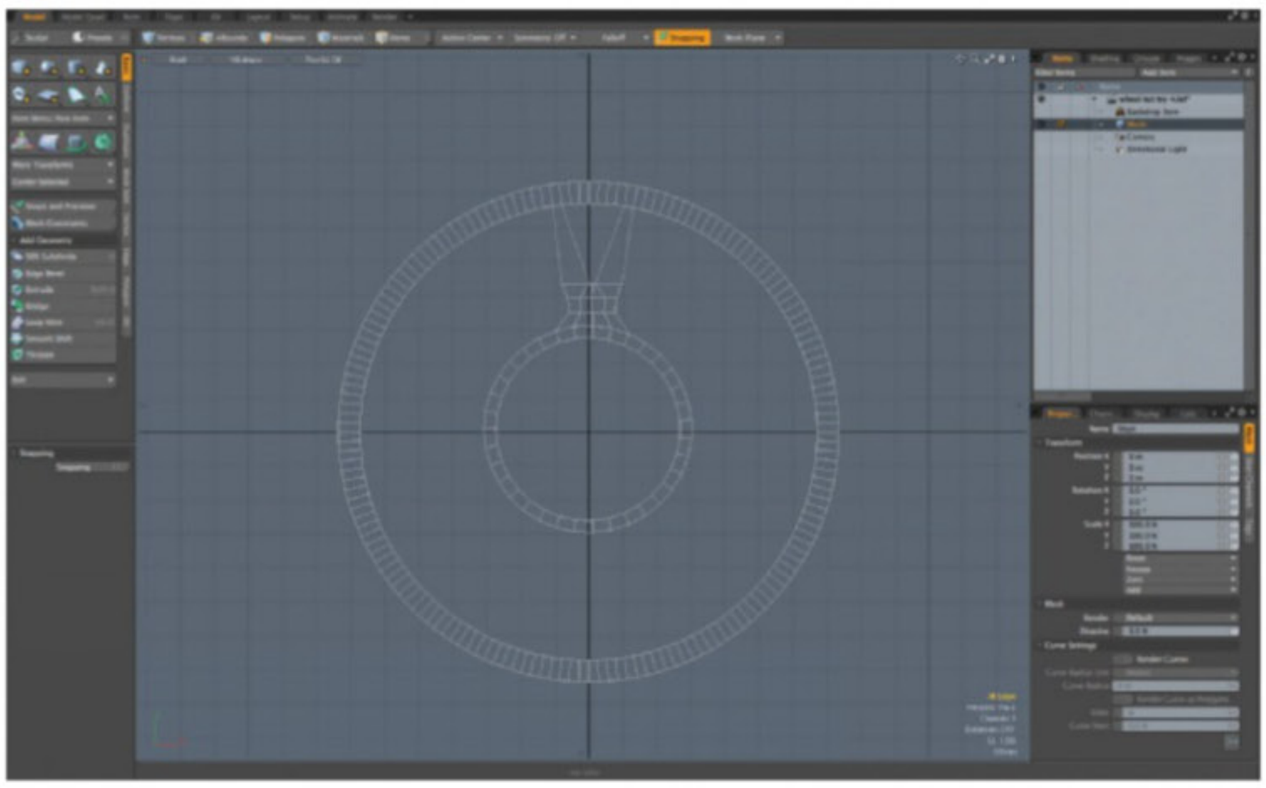
Even for first-time MODO users, it's very obvious how many more features have been included into the indie edition. The dynamics, animation and rendering capabilities have all been added, and now the FBJ and OBJ poly output limit has been increased to 100k (200k Tris) too.

Of course, like any other piece of 3D software there is a learning curve involved in learning MODO indie. For those who have not used MODO before, it isn't too intimidating to start as there is a very clean UI and intuitive design. Besides, you really do get an impressive amount of features, from a fully integrated texture painting and texture baking tool to the awesome complete MODO 801-based modelling workflow with sculpting functionality. Elements such as the Sketch extrude tool, which literally enables you to extrude geometry as you move your mouse, along with the Bevel tool, Edge Extend tool and Thicken tool for example, really made modelling incredibly fast and easy.

Unfortunately there is still no support for custom scripts/plugins, which is a pity considering how many there are for the full MODO 801. Another restriction is the indie file format, which is licensed to you as an individual so that only you can open your files from your Steam account. Indie files cannot be worked on by anyone else, even if they have a full version of MODO. Though this wasn't a problem for us at the testing stage, it may be troublesome for a team of developers.



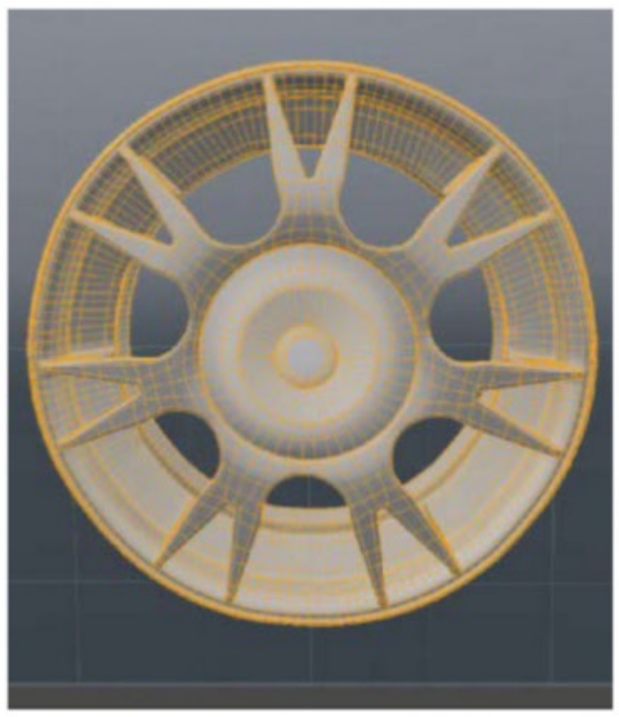
A wheel work-in-progress using MODO indie's Edge modelling tools – it's simply ideal for hard surface objects and environment structures



Find out more about MODO indie on Steam at **store.steampowered.com/app/321540** and on The Foundry's official website at **www.thefoundry.co.uk/about-us/news-awards/the-foundry-launches-modo-mari-indie**

Despite these restrictions, MODO indie is certainly a piece of software that is of great value for the price: a permanent licence will set you back £229.99, or £290.99 for a bundle that includes permanent licences for MODO indie and the new MARI indie. There's also an option to have access to the subscription from just £7.49 per month for six months. There are no commercial restrictions in place for individual use either, which means you are free to use your creations for all of your paid projects.

Overall, MODO indie is truly a very competitive, exciting new choice, especially if you're a single indie developer or a hobbyist. It's even a great cut-down version for those who are simply curious about using it as a learning tool and are ready for an upgrade to the full MODO 801.



Also launched with MODO indie on Steam was MARI indie, which enables users to paint and texture intuitively onto 3D models, as well as import Photoshop brushes

Essential info

Price: £229.99 for permanent licence, or subscription options of:
£10.95 for 1 month
£9.33/month for 3 months
£7.49/month for 6 months

store.steampowered.com/app/321540

OPERATING SYSTEMS

- Windows 7 and 8 (only 64-bit supported)
- Mac OS X 10.7 and up (only 64-bit supported)

TECHNICAL SPECIFICATIONS

- Intel processor(s), Core2Duo processor or higher (Mac) / Intel Xeon/Core 2 Duo, Quad/Core i7 or AMD Opteron/ Phenom processor(s). Must support SSE2 instruction set (Windows)
- Memory: 2GB RAM
- Graphics: OpenGL 2.0 accelerated graphics, at least 1280x800 resolution
- Network: Broadband Internet connection
- Hard drive: 2GB available space

Additional Notes: Mouse or pointing device, including pressure sensitive tablets or 3Dconnexion 3D mouse. Internet connection required for Steam

The good & the bad

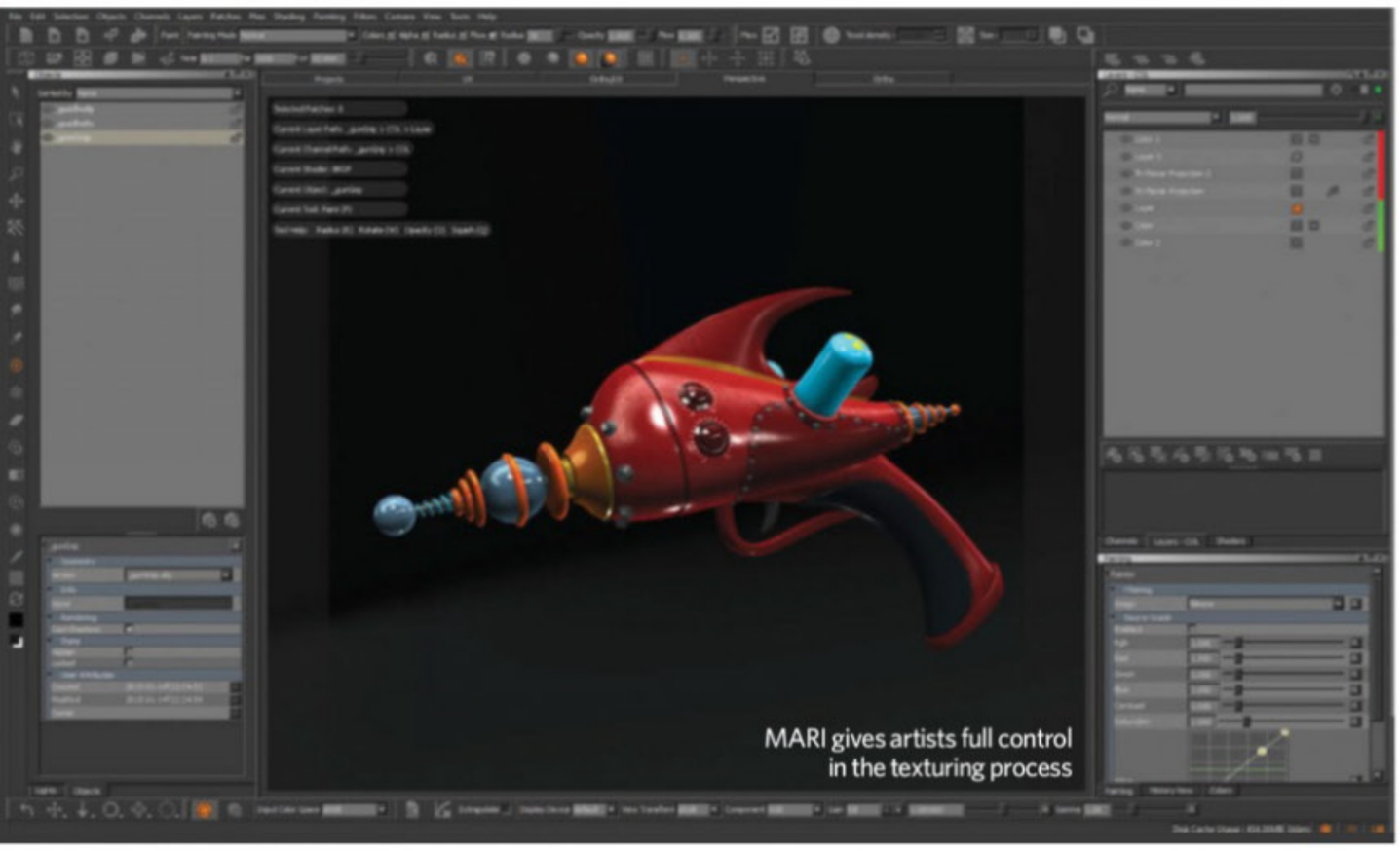
- ✓ Uses MODO's production-proven workflow
- ✓ Clean UI
- ✓ Full access to modern MODO modelling toolset
- ✓ Dynamics, animation and rendering capabilities have been added since MODO SE
- ✓ Competitive pricing strategy, including both rental and permanent options for the user
- ✗ No support for any scripting/plugins
- ✗ Indie projects are locked down to one person's licence, assets can't be shared, can only save in LXF format
- ✗ Exports as FBJ and OBJ file types only
- ✗ Limited Bake and Render resolution to 4K

Our verdict

Features	7/10
Ease of use	9/10
Quality of product	8/10
Value for money	10/10

> "Despite restrictions, MODO indie is certainly a piece of sofware that is of great value for the price"

Final Score 8/10


MARI gives artists full control in the texturing process

MARI indie

The Foundry releases a low-cost version of its texture-painting software for the indie game industry

REVIEW BY Daniele Orsetti, senior texture artist, UK

MARI is a 3D texture-painting software developed by The Foundry, and it has now become the standard for high-end texturing in almost all the visual effects facilities around the world. The full version of the software can handle textures up to 32K resolution and thousands of textures per model, enabling almost infinite control on the texturing process. This level of flexibility is essential to VFX artists, but it might not be all that necessary for artists working on smaller projects.

MARI indie is a low-cost, limited version of MARI. Its features have been designed to make it a useful and affordable tool for individual developers and freelance artists in the game industry. Its competitive price (it costs less than ten per cent of the full version) will make it appealing to freelance artists in general, as well as hobbyists looking to enhance their texturing skillset.

The first big difference with the indie version of the software is how project files are handled: MARI indie can only be purchased from Steam and all the projects created with it will be linked to the user's Steam account – meaning that users will not be able to share their projects.

The other differences affect the usability of the software itself. Users will only be able to work on two UDIMs per object and can import three objects per scene. One object can of course be made of as many combined meshes as needed, so if artists organise their meshes properly, they will be able to work with six UDIMs per asset at most.

Texture resolution is limited to a maximum of 4K at 8-bit colour per channel, and the available export formats are PSD, PNG, TGA and JPG. Python scripting and custom shaders are disabled too.

The decision to remove the EXR and TIF formats limit the resolution, which make it clear that this version of MARI is mostly aimed at people of the indie gaming world, rather than at any VFX freelancers.

Other than these limitations, MARI indie is based on the same codebase of the full MARI, so developers will be able to access all of its powerful tools. These will include: the layer system, transfer textures tool, alembic support for animated caches and physically-based shaders.

Sharing the same code also means that MARI indie is constantly updated along with the full MARI. Those who have purchased MARI indie as a monthly subscription will therefore receive updates when available, and artists purchasing MARI indie as a perpetual licence will be able to access updates by paying an update fee.

Finally, MARI indie is free of any commercial restrictions, making it an appealing software, given that indie solutions from other software houses usually put a cap on the yearly income of the artists.

This version of MARI is definitely a huge deal for anyone who is willing to learn the software to use it on independent projects.

Essential info

Price: £114.99 for permanent licence, or subscription options of:
£9.99 for 1 month
£7.66/month for 3 months
£4.99/month for 6 months

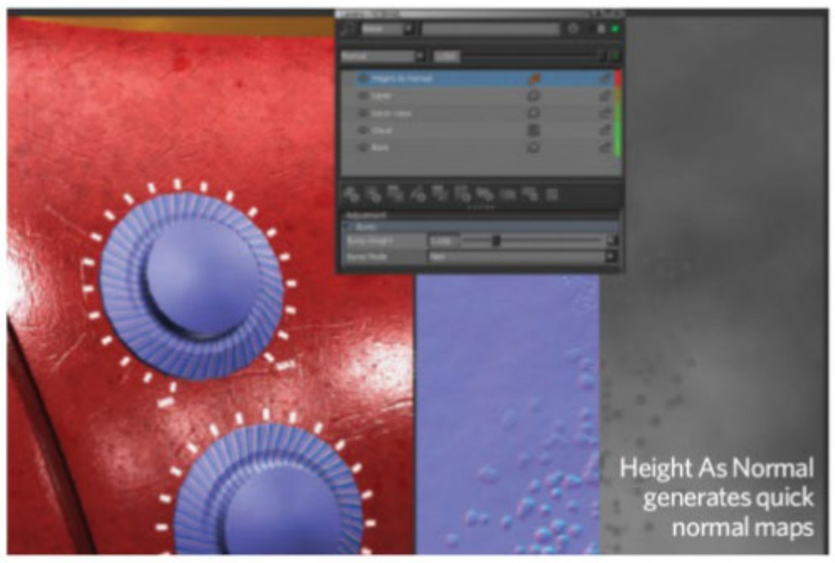
http://store.steampowered.com/app/289550/

OPERATING SYSTEMS

- Windows 7 and 8 (only 64-bit supported)
- Apple OSX 10.8.5 and up or Ubuntu 12.04 LTS (only 64-bit supported) and up

TECHNICAL SPECIFICATIONS

- Requires Nvidia or AMD graphic cards with at least 1GB of RAM and OpenGL 3.2 support


Height As Normal generates quick normal maps

The good & the bad

- ✓ Competitive price to start using this amazing software
- ✓ No commercial restrictions – once you buy it you can earn as much as you want using it
- ✓ Access to all the tools of the full version of MARI
- ✗ Requires a good hardware configuration to run properly
- ✗ Impossible to share
- ✗ Doesn't include tools to automatically generate edge or cavity masks
- ✗ Ambient Occlusion can be baked but is vertex-based

Our verdict

Features	7/10
Ease of use	8/10
Quality of product	8/10
Value for money	9/10

> "MARI indie is based on the same codebase as the full version of MARI"

Final Score 8/10

Element 3D V2

With CINEWARE built into After Effects CC, is there much need for Element 3D V2?

REVIEW BY Vincent North, motion graphics artist, UK

When Element 3D first came out it was the only way to import 3D objects into an After Effects project, which of course was a hugely exciting idea. On top of that, you can also use the lights and cameras built into After Effects to create your projects without having to leave the program and composite them in, so it was a very useful tool and, most of all, a great time saver.

With the release of After Effects CC, Adobe and MAXON teamed up and worked together to develop their own plugin called CINEWARE, which is their way of importing 3D models straight from Cinema 4D into AF. This makes the original purpose of Element 3D look a little obsolete if you use After Effects CC. But, if you do not, then this plugin will be very useful for creating 3D motion graphics and VFX.

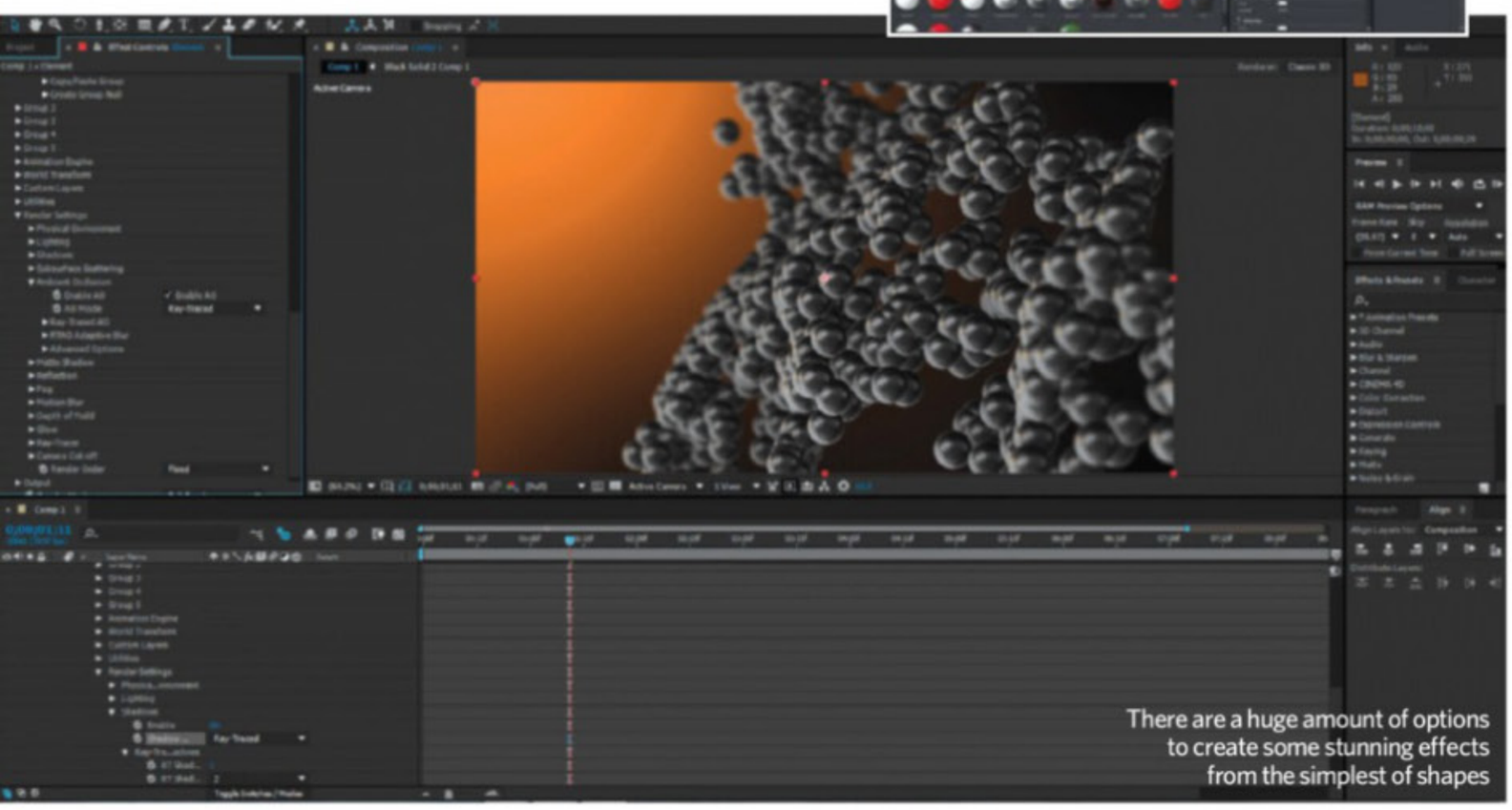
So what does Element V2 have to offer? In the new version Video Copilot has added important lighting effects like shadows, ambient occlusion and dynamic reflections maps along with a very slick redesigned UI and GPU acceleration too.

The system has two interfaces. The first is your standard AF effect interface and the second is Element's own interface that can be opened up within AF. Element V2's UI has a very clean and intuitive design with simple to understand features. Within this UI you can import or design your own 3D objects and shapes. However, the ability to make shapes within the plugin is very limited and you would still need to use Cinema 4D to create more complicated objects. The main advantage of using Element's interface is for creating 3D text as even the most inexperienced 3D artist could design and animate something that looks good quickly.

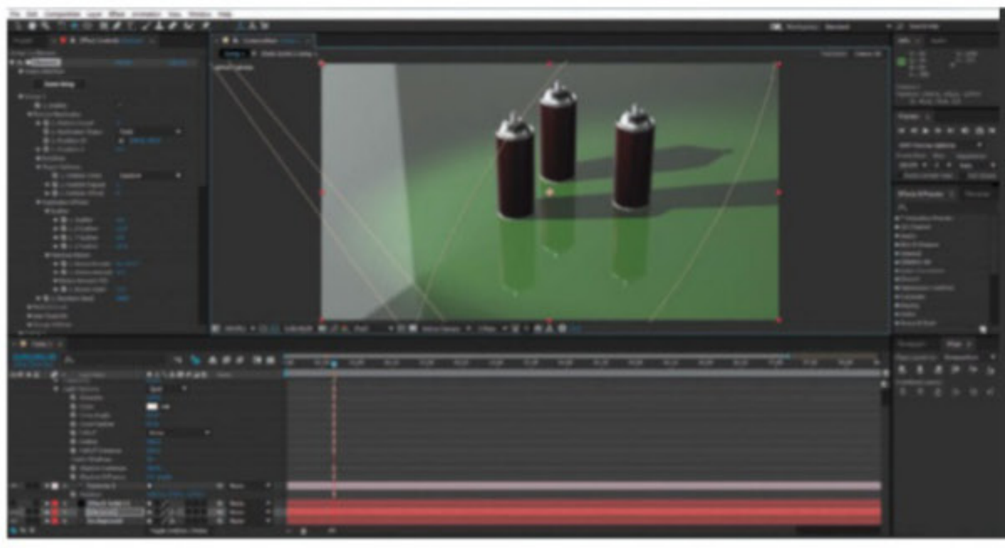
The most powerful aspect of Element 3D V2 is in your After Effects UI as there are all kinds of useful options to create stunning 3D visual effects and animation. The real power comes from the fact that the objects are treated as particles, therefore you have the power to duplicate objects and shapes thousands of times whilst using various deformers to manipulate, vary and animate your object in many different ways. Of course the more polygons your objects or shapes have, the slower the plugin will perform, but even deforming low polygon shapes can have some fantastic results!

The possibilities with Element 3D V2 are endless. This plugin is a hugely powerful tool. It has the capacity to save you a lot of time through rendering, but it can also create some stunning effects and help to expand your artistic vision.

The intuitive UI makes it easy to make changes to objects and shapes



There are a huge amount of options to create some stunning effects from the simplest of shapes



The improved lighting and reflection effects make this plugin a great time saver

Essential info

Price: £130.45 / $199.99 US*

www.videocopilot.net/products/element2

OPERATING SYSTEMS

- Windows 7 and up
- MAC OS 10.7 and up

COMPATIBILITY AND OPTIMISATION

- After Effects CS5 and up
- Nvidia and ATI card supported. For ideal performance 1GB VRAM is required

The good & the bad

- ✓ Fantastic creative potential
- ✓ Fast performance
- ✓ Intuitive design
- ✓ Fast rendering of 3D objects
- ✓ Great for quick changes to textures and colours
- ✗ Almost obsolete if you own After Effects CC
- ✗ Modelling system is a bit too basic
- ✗ A bit buggy at times, especially when switching ambient occlusion on (though this might be an After Effects problem)

Our verdict

Features	8/10
Ease of use	7/10
Quality of product	9/10
Value for money	9/10

"Great for creating stunning 3D VFX with a fast render time, and makes simple changes quickly"

Final Score 8/10

*Price conversion correct at time of printing

ZBrush Characters & Creatures

This tutorial-based ZBrush character creation book takes you through using the software, from speed-sculpting to lighting and texturing with the help of 17 industry professionals

REVIEW BY Larissa Mori, 3D Artist magazine

Lauded by artists like Andrei Cristea and Rafael Grassetti, 3DTotal's new *ZBrush Characters & Creatures* book certainly comes with some excellent recommendations. It also comes packed with a host of great authors: 17 artists working in the industry today including Mariano Steiner, Mathieu Aerni, Kurt Papstein and Piotr Rusnarczyk.

Just like 3DTotal's *3ds Max Projects* book, *ZBrush Creatures & Characters* is more of a practical guide than a theory-based one. The book is divided into a series of different projects, with the pipeline of each of these broken down into tutorial form by the ZBrush artist behind it.

Through this structure an impressively wide variety of theories and techniques are covered. The first 35 pages, for instance, cleverly start the book off with speed-sculpting tutorials by Daniel Bystedt, Mariano Steiner, Bruno Jiménez and Mathieu Aerni with plenty of large, inspiring images portraying each part of their process.

ZBrush Characters & Creatures then carries on in a very similar vein with a series of different ZBrush project-based tutorials looking into the invention of three unique, fantasy-style quadrupeds as well as some very highly detailed ZBrush creatures on two feet by Bryan Wynia, Glauco Longhi, Zsolt Vida and more. Next comes a section on different types of aliens and setting up sci-fi elements with techniques, including sculpting a four-legged alien and a cyborg alien.

With such an enormous wealth of information to take in and so many different ZBrush projects to try, another exciting thing offered when reading the text are the free resources available to download to anyone for free – even if you don't own the book – from **www.3dtotalpublishing.com/product_zbrush_cc.html**. There are only files for a few tutorials included however: OBJ and ZTLs for three tutorials on a creature, quadruped, and speed sculpt by Daniel Bystedt as well as six 1692 by 1060 MP4s showcasing the creation of the zombie by Mariano Steiner featured as the second of the speed-sculpting projects.

The last two sections of the book are particularly useful. Instead of a variety of different project tutorials, these both go into much more depth by featuring only two complete projects and these two are spread out over around 50 pages each – female fantasy figure The Harpie Queen by Bad Robot's Kurt Papstein and a female sci-fi character by freelance character and games artist Piotr Rusnarczy. As a final piece of inspiration, *ZBrush Characters & Creatures* then ends with a gallery of some of the best work recently produced by ZBrush artists – along with a list of their top tools.

Though it might be challenging to immediately grasp every concept as a complete beginner, if you know the ZBrush basics and want to learn something new, rest assured that this book goes through everything from different brushes to masking, alphas, polygrouping, retopology, prop creation, texturing, lighting, render settings and more; it's all very practical and in the context of a character creation project.

The tutorial-based *ZBrush Characters & Creatures* book from 3DTotal is just as elegantly laid out and full of expert projects as its past titles

Essential info

Price: £29.99 / $49.99

www.3dtotal.com

AUTHOR
Various

PUBLISHER
3DTotal Publishing

ISBN NUMBER
978-1-909414-13-6

A look into Mariano Steiner's tutorial modelling, texturing, lighting, and rendering a credible aquatic creature

Recommended by artists like Andrei Cristea and Rafael Grassetti, the book is available to buy now from **shop.3dtotal.com** for £29.99

The third chapter looks into the creation of different unique creatures with ZBrush tutorial projects by a variety of artists

Our verdict

Quality	9/10
Ease of use	8/10
Overall usefulness	8/10
Value for money	9/10

"Through its structure, an impressively wide variety of theories and techniques are covered"

Final Score 9/10

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David 'vyle' Levy

Leading international concept artist David 'vyle' Levy reveals how he went from 2D art to directing a short

inside

> "I would say that the best advice is to have a precise shot goal as opposed to a more vague goal"
>
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Hussar: Blade First Fantasy
David 'vyle' Levy
After experiences working on triple-A videogames and Hollywood movies such as *Prometheus* and *Avatar*, Levy talks to us about his experiences as a director

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Position-Based Dynamics in action. For a full list of features, visit www.sidefx.com/H14

Side Effects releases Houdini 14

Highlights include a new Position-Based Dynamics solver and artist-friendly crowd simulation system

Following a sneak peek of the update posted on the company's Vimeo last year, Side Effects Software has now officially announced the release of Houdini 14. Exciting features include a new Position-Based Dynamics solver, which is ideal for the creation of wet and dry sand and can also be used by artists to create solids, sheets or tethers for generating soft body, cloth and wire-like simulations. Multithreaded thanks to its exclusive reliance on VEX-based operators, the new solver can run on the CPU or on the GPU using OpenCL.

Meanwhile, a new crowd system complete with artist-friendly shelf tools, a new packed agent primitive type and hardware-accelerated display of instant crowds has also been implemented. These will all enable Houdini's users to control and manipulate crowd layout, steering, collision avoidance, terrain adaptation, motion blending and look-at targets.

"With Houdini 14, a great deal of work has gone into user experience," says Cristin Barghiel, VP of product development at Side Effects Software. "From preselection highlighting to new handles, improved edge-loop selection, new UV Flatten and UV Layout tools with UDIM support, grooming tools for hair and fur, an advanced visualiser architecture, custom panels and more."

Barghiel goes on to discuss the benefits for animators, "Animators will appreciate the much improved Animation editor with Animation layers and speed improvements to the display and playback of rigs."

The new Houdini 14 features include a Position-based Dynamics solver, which is able to create solids, sheets or tethers for generating soft body simulations

Wacom launches new Cintiqs

The new flagship tablets are 27 inches and can display 1.07 billion colours

CES this year saw the introduction of some very anticipated new tablets from Wacom, including two brand new 27-inch Cintiqs: the Cintiq 27QHD and 27QHD Touch, as well as a Cintiq Companion 2. The flagship 27QHD and Cintiq 27QHD Touch feature a 27-inch, 2560 by 1,440, seamless, edge-to-edge glass working surface, and a colour quality that displays 1.07 billion colours and 97 per cent of Adobe's colour gamut. Along with Wacom's pen with 2048 levels of pressure sensitivity, users of the new tablets will also be able to access the Cintiq 27's new ExpressKey Remote, which can be placed anywhere on the screen or desk to use customisable keyboard shortcuts and modifiers.

Meanwhile, Cintiq Companion 2 combines the best of the Cintiq Companion and Cintiq Companion Hybrid. As a fully mobile Windows 8 tablet, the Cintiq Companion 2 has the full capabilities of its predecessor and can be connected to a Mac or PC to be utilised as a more traditional tablet display.

You can buy the Cintiq Companion 2 for £1,199.99, and the Cintiq 27QHD and Cintiq 27QHD Touch for £1,799.99 and £2,099.99 respectively

The Cintiq 27QHD Touch enables you to rotate, move, and pinch your work with your hands – replicating the process of sculpting with clay

● **HAVE YOU HEARD?** • Blender 2.73 is out, with a Grease Pencil upgrade and a new minimalistic fullscreen mode

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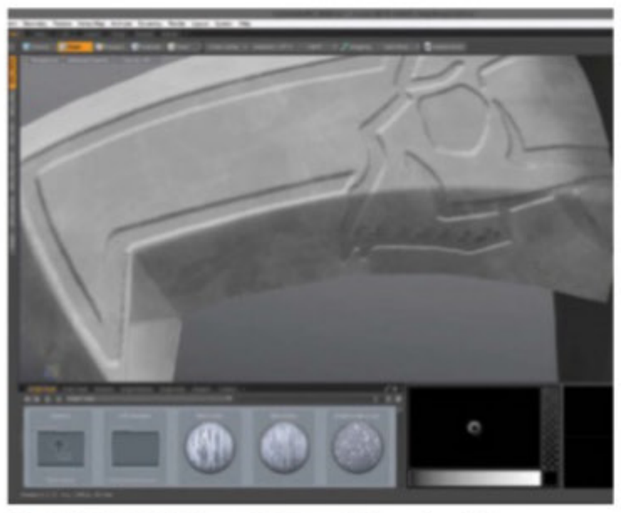
The Foundry and MakerBot to create Kit

The two companies announce that they will collaborate on first MakerBot Kit for MODO

The new MakerBot Kit for MODO will let users create and edit designs using MODO 801, then push those directly onto MakerBot's Thingiverse or save them privately. MakerBot for MODO has been designed to optimise the 3D workflow for an easier, faster creation and printing process for 3D objects.

For the first time, Thingiverse users now have a powerful, integrated tool to create 3D designs or expand on other people's designs – all using common interfaces and file formats.



Buy MODO 801 from £999 and download the MakerBot Kit for free at **www.thefoundry.co.uk/products/modo/kits/makerbot**

HP debuts 3D VR display

Monitor enables interactions with holographic projections

HP has also released both 4K and 5K ultrahigh-definition displays, as well as curved displays for consumers and professionals

After introducing its very unique take on a 'creativity station' with the Sprout PC, HP has delved into expanding the range of its portfolio yet again with a new interactive virtual display: the HP Zvr. Powered by zSpace technology, the Zvr lets any user wearing a set of 3D glasses to manipulate 3D projections that appear to float straight out from the monitor: a high-definition, 3D stereoscopic display.

Head-tracking via four cameras enables the images to be projected at an appropriate angle, and a pen-like input device then lets the user interact with anything they see.

Cinesite turns to animation

Studio giant will release family-friendly features

Together with 3QU Media – a newly formed CG-animated feature production company headed by producer of *Shrek*, John H Williams – Cinesite has announced a new move into feature animation. The company's first animated short, 'Beans', quickly became a massive online success with millions of YouTube views and earned the opening slot in 2014's SIGGRAPH electronic theatre, so it's an announcement that has been in the pipeline for some time.

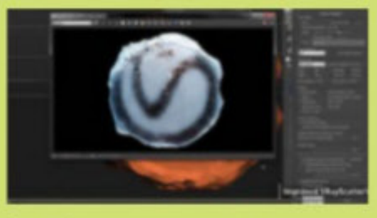
Cinesite's first feature film will be *Charming*, an animated comedy that reimagines the tales of three iconic princesses: Cinderella, Snow White and Sleeping Beauty, who find they are all engaged to the same Prince.

The initial poster for the first feature film from Cinesite will be called *Charming*

Software shorts

Bringing you the lowdown on product updates and launches

V-Ray 3.0 for 3ds Max SP1



Chaos Group has announced Service Pack 1 for V-Ray 3.0 for 3ds Max, which features further improvements to render speeds along with a new Microfacet GTR/GGX BRDF. It also has new V-Ray RT GPU features including support for rendering hair and subsurface scattering. Service Pack 1 for 3ds Max is free to all V-Ray 3.0 customers. Log in to chaosgroup.com to download it.

KeyShot Enterprise Edition

Luxion has released the new KeyShot Enterprise Edition: a transformation of the 3D rendering and animation software that will combine all KeyShot features and add-ons together, including KeyShot Animation, KeyShotVR, Network Rendering and Siemens NX Integration. You can buy it now for $3,995 (£2,642) from the KeyShot website www.keyshot.com/buy.

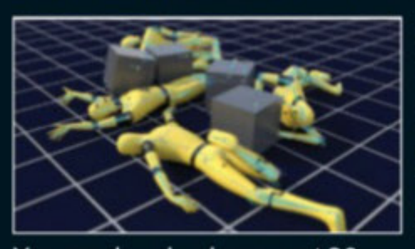
Autodesk's Project Wire

AUTODESK.

Autodesk has announced Project Wire, a new design tool for placing components, routing wires and manufacturing multimaterial electronic devices. It uses the world's first 3D electronics printer from Voxel8, which has just launched its first Developers Kit for $8,999 (£5,951). Discover more about it at www.voxel8.co.

LightWave 2015

LightWave 3D Group offers full licence for the new 2015 tool at $995 (£658)



You can download a no-cost 30 day full-feature trial of LightWave 2015 at **www.lightwave3d.com/try**

Available for both Windows and Mac OS, NewTek's LightWave 2015 release includes many highlights. These include bullet constraints for dynamic simulations, importance sampling to greatly improve the quality of lit scenes, and the Genoma 2 character rigging system to be able to set up complex rigs quickly from scratch. Even more excitingly, LightWave 2015 has been released at a substantially lower price point of $995 (£658) for a full licence, or $495 (£327) to upgrade for registered LightWave 11.x or earlier users. Visit **www.lightwave3d.com/buy** to purchase or locate an authorised LightWave reseller.

DID YOU KNOW? ▪ 3Doodler has received a makeover with 3Doodler 2.0, which is now lighter, smaller and more efficient

Industry insider

David 'vyle' Levy

Senior concept artist/director

Going from 2D concepts to directing a sci-fi short isn't easy. David 'vyle' Levy discusses how he did it

About the insider

Job title Senior concept artist/director

Location Los Angeles, US

Website www.vyle-art.com

Biography David Levy is a leading international concept artist. He studied industrial design and architecture in France and the Netherlands respectively, and he is currently working in Los Angeles, California as senior concept artist in the movie and videogame industry.

David 'vyle' Levy's experience as a 2D concept artist is impressive indeed, having plied his trade on triple-A videogames and Hollywood event movies such as Ridley Scott's *Prometheus* and the upcoming *Avatar* sequels directed by James Cameron. Levy's CV just grew even more remarkable, however, with 'director' being his latest addition. He recently released sci-fi short, 'PLUG', which had more than 140,000 views in three weeks on Vimeo.

The process wasn't easy for Levy, especially considering that he needed to learn VFX compositing techniques in order to bring his vision to life.

"PLUG began as a project a friend of mine and I thought would originally be a one minute snippet of a cool universe to demonstrate our artistic abilities," he tells us. "At the time all the elements were already there in terms of rough atmosphere: the main female protagonist, the desert and some kind of giant robot... it really got our brains going, and it was tons of fun to think about our own IP." Vyle built a team and after lots of hard work (including building props) 'PLUG' was brought to life.

"One of the key concepts we wanted to get across in the short film is the overall 'green' angle that the robots are taking in the story, as opposed to the usual *Terminator* 'bad robot' vibe that most sci-fi films have. Robots are here to make us realise our mistakes, and humans are more like the drunk dad of the family who has trouble keeping his life together. In some ways, technology has never been the problem – humans misusing it are."

We learn all about the challenges of being a director for the first time and the benefits of learning the role...

How difficult is it to self-finance and direct a short film such as this?

Juggling the directing, financing and VFX part of it was a lot. I never thought that I would wear all these hats, but the experience taught me that very often, in the end, everything hinges on the motivation and dedication of one person. That person is like the last captain on the ship: whether the ships sinks or arrives safely to port is all in his hands. By the time you are in the middle of the storm, most people have already left – excited by other projects or have become tired of the relentless amount of work. I guess that's indie film-making for you!

Can you talk a little about your experiences learning compositing and camera tracking?

I learned compositing thanks to Andrew Kramer and Video Copilot. Their tutorials, tools and knowledge were instrumental in me picking up After Effects.

Being a concept artist, I had a very good knowledge of Photoshop. I had also done a bunch of editing while making short films for the last ten years using different cameras (Bolex D16, DV cameras and DSLRs) and Adobe Premiere, so I also had a good understanding of frame rates and lenses. But bridging everything together was truly possible thanks to Adobe Creative suite. The fact that most of the software was living under Adobe's umbrella made it easier for me to pick up the software.

After Effects is such a deep program though, that it took me a while to really be proficient at it. I knew the learning curve was going to be brutal, so I decided to plan all the shots in an increasing difficulty so that I would do the hardest shots with the most knowledge. I basically planned one year of VFX work, based on my knowledge evolution from being a complete newbie to becoming an educated newbie.

How has this experience changed the way you approach 2D concept art?

Now, when I do 2D concept art, I think about it more like a shot and how effective that shot would be in a production. During the polish phase on 'PLUG' I redid some shots entirely, sometimes up to four times. All that time I wouldn't be able to find the right tone and had to restart from scratch because it felt too cheap. It can be a very painful realisation during re-editing that a shot which took four days to do just had to go in the trash because it was not right after all.

Portfolio highlights

Some major projects that David 'vyle' Levy has worked on:

2017 *Avatar 2*
2016 *Spectral*
2015 *Tomorrowland*
2013 *Ender's Game*
2012 *Prometheus*
2010 *Tron: Legacy*
2007 *Assassin's Creed*
2005 *Prince of Persia: The Two Thrones*

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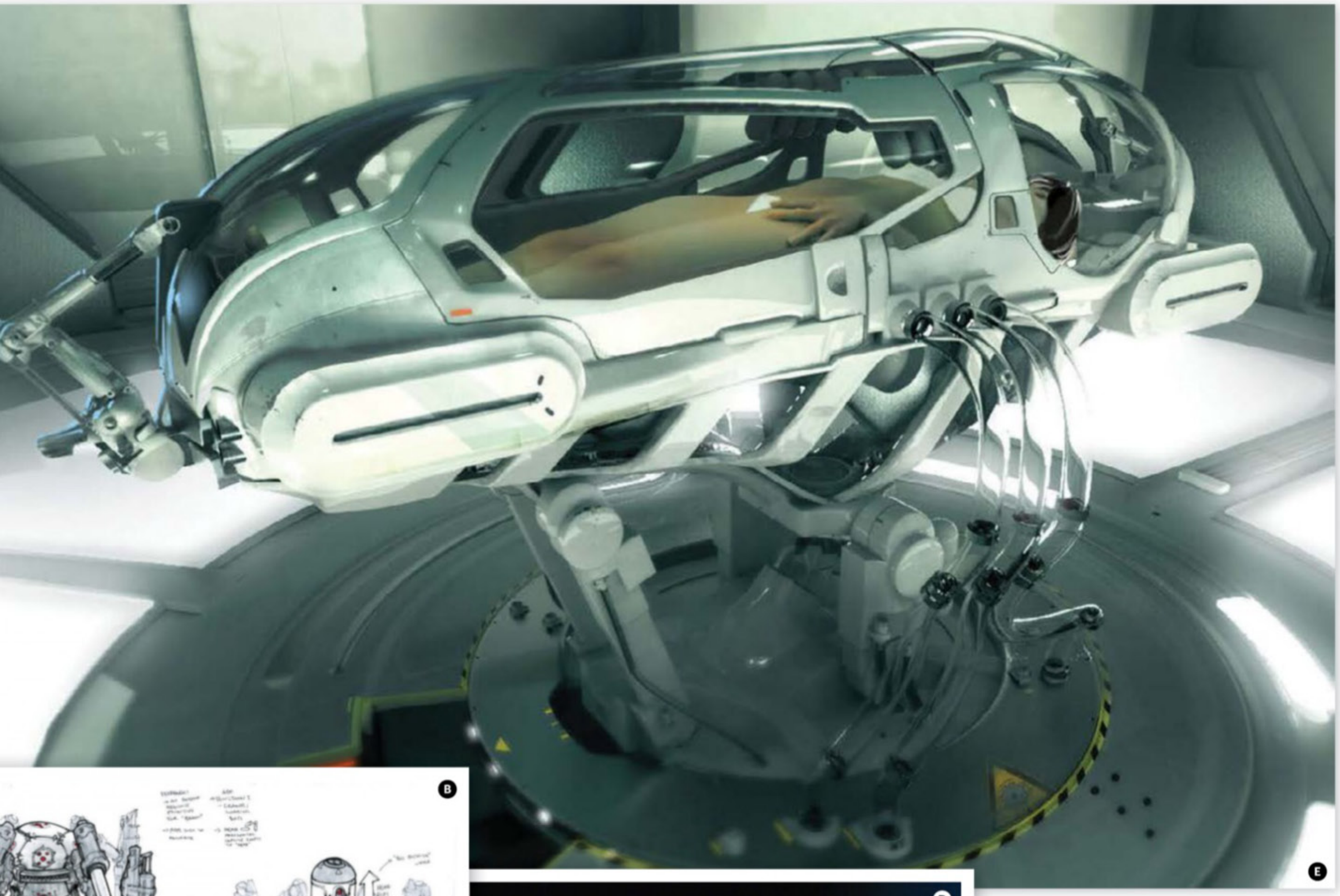
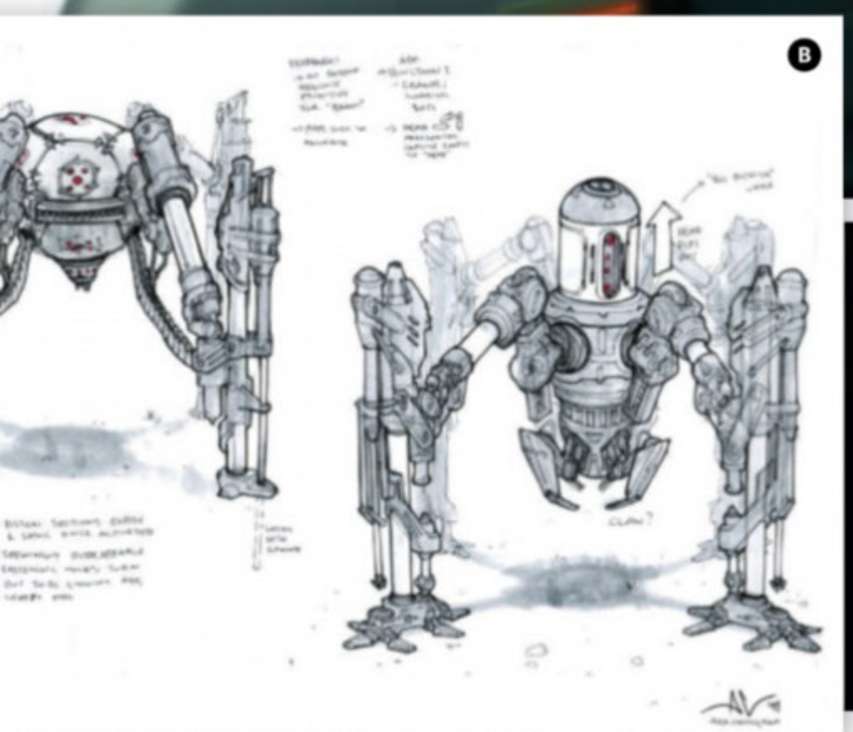


Alien image © 20th Century Fox. All other images © DavidLevy



B

C

D

A backpack of super powers

Levy offers his advice for those looking to take the leap into VFX software themselves

"I would say that the best advice is to have a precise shot goal as opposed to a vague 'I want to learn that software' goal. Having a precise goal pushes you to find solutions rapidly. It's easy to get lost in a piece of software and get nothing out of it. Just remember, every shot is different, and everything you learn will be used at some point in another shot. So it's almost like slowly filling your backpack with a set of superpowers that have their own place for helping you in the future."

A "Due to my inexperience as a first-time director, I went way over my budget," says Levy. "Considering the result, we did a very cheap, high-quality short film."

B The team included Guillaume Raffi (a commercials/VFX producer) as well as Alex Cunningham and Lex Cassar, two "talented and motivated" art centre students.

C "From beginning to end, if I compress all the days worked, it was around six months of daily work nonstop on my side," says Levy of the production period for 'PLUG'.

D "I was extremely motivated to do the opposite of a lot of sci-fi shorts lately: shoot on camera and avoid VFX unless it added to the storytelling," says Levy.

E Levy said Sergio Leone was a big inspiration. "I was thinking: what if his style of filming was used in sci-fi. What also came to mind was *Star Wars* and *Mad Max*."

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Samurai
Hasan Bajramovic

Technique focus

Incredible 3D artists take us behind their artwork

SCULPTING My approach to the clay-like feel in this sculpt was actually very straightforward. It was sculpted in ZBrush and I mostly used Clay Tubes with its default alpha. I tried to think of it traditionally – where you would put on clay slabs and try to blend them in with existing clay. Instead of smoothing I would add clay, then subtract for a smoothing effect. **Movement,** 2014

Morten Jæger

3DArtistonline

Username: MjTheHunter

Website
www.mj-design.dk

Country Denmark

Software used ZBrush, Maya, Photoshop

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- 25 textures from 3DTotal
- Tutorial scene files and assets
- All of the tutorial image files to help you follow along with the issue

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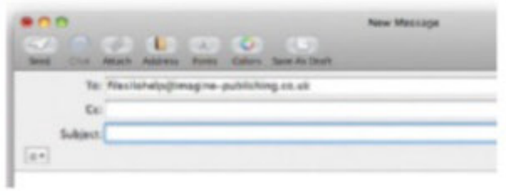

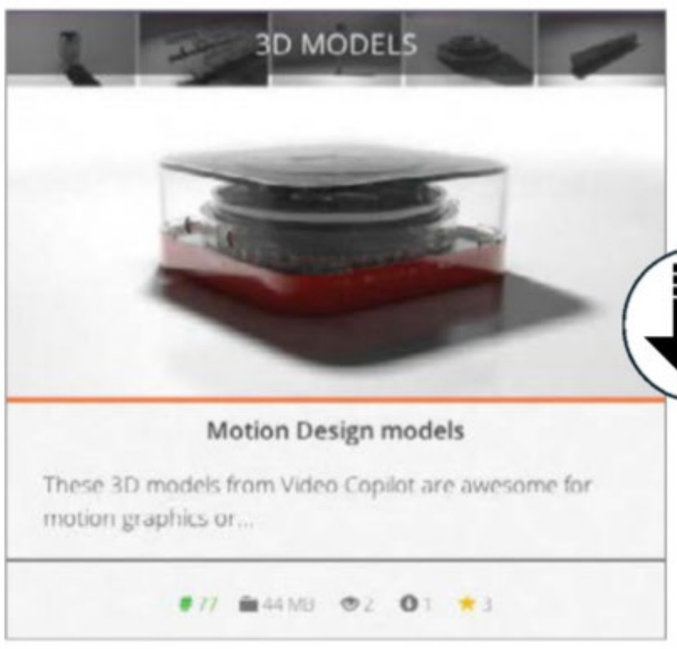
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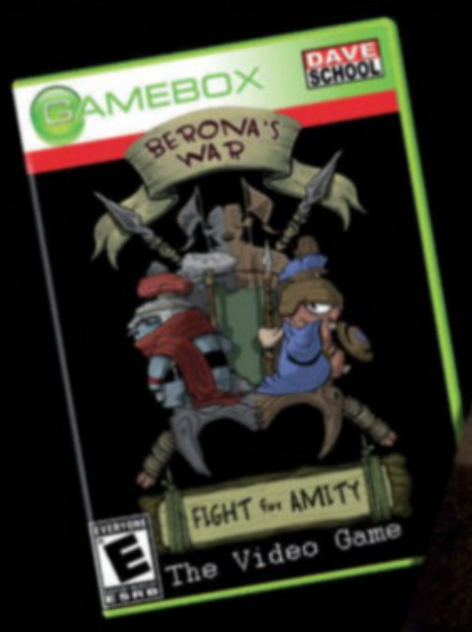

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